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GOVERNMENT OF NORTHERN IRELAND
MINISTRY OF AGRICULTURE

MONTHLY REPORT
OCTOBER, 1936



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OCTOBER, 1936.

thou hast thy music too,
 While barred clouds bloom the soft-dying day
 And touch the stubble-plains with rosy hue ;

The talk given by Mr. H. G. Robinson, M.Sc., Principal, Midland Agricultural College, Sutton Bonnington, Loughborough, Leicestershire, at the invitation of the Ministry, to pig breeders at the Royal Ulster Agricultural Society's Autumn Show and Sales, held on the 24th September, is also included in this report for the benefit of those interested in pig production. This begins at page 23.

AGRICULTURAL CONDITIONS.

AGRICULTURAL CONDITIONS AT 1st OCTOBER, 1936.

Unsettled weather conditions prevailed during the greater part of September. The month opened with grey skies and dull days, and intermittent heavy rainstorms were experienced until about the middle of September, after which conditions gradually showed a marked improvement. Warm temperatures were experienced during the wet period, but later, when the weather became drier, lower temperatures prevailed, bringing night frosts which remained on the ground until morning sunshine appeared.

Strong winds, accompanied by heavy rains, prevailed in the earlier part of September, while fogs also occurred. From the middle of the month, however, with the exception of one day's heavy rain, on the 25th, the weather was ideal for outdoor work.

The spell of summer weather, which featured the latter half of August, and raised hopes of saving the remainder of the crops in good condition, was abruptly ended at the commencement of September, and the heavy rains and storms again brought about a complete change of scene. Further lodging and tossing of the growing grain crops took place, and much damage was caused to the sheaves in the stooks. The potato and hay crops also suffered additional damage to varying extents, and, in general, the whole prospects for the harvest were particularly gloomy.

With conditions generally adverse until the second half of September, the harvesting work was slow and troublesome, but strong efforts were made during the last ten days to overtake arrears, and in most districts the storing of the hay crop has been completed and the oat crop cut and stacked. The threshing of oats was also commenced, but in most cases this work was carried out hurriedly as a precautionary measure in view of the fear of "heating" in the stacks. The digging of main crop potatoes also was proceeded with in the early districts.

The continuance of warm and moist conditions, well into September, resulted in grass lands remaining in a luxuriant condition right up to the arrival of the ground frosts, which have since checked growth and caused the herbage to become dried up in some areas.

Store cattle have made an excellent thrive, and the herds are generally in good health, but "hoose" continued to prove a source of trouble among young

animals, and outbreaks of "redwater" have been fairly prevalent among store and dairy cattle. Sheep are in good condition, but the very wet weather continued favourable for attacks of "foot rot", whilst "fluke" was reported to be on the increase in some districts.

Notwithstanding the rather unsatisfactory state of the crops, it is unlikely that supplies of home-grown foodstuffs will be much below general requirements for the winter, but the quality of much of the produce will be lower than the usual standard. Present indications are that supplies of hay, straw and oats, although somewhat variable in quality, will be sufficient; but the position regarding the state of the turnip crop is tending to create a certain amount of anxiety among stock-owners.

Purchased food stuffs continued plentiful throughout the month at firm rates.

THE CROPS.

WHEAT.—The harvesting of the spring varieties of wheat, which on account of adverse weather conditions last winter constituted the bulk of this season's wheat crop, was continued during the favourable weather of late September. These operations, which have been unduly late this year, were practically completed at the end of the month; only a few fields, which had been sown very late, remaining uncut.

A small portion of the crop has been threshed, and it is estimated that the yields of grain and straw will be only slightly below the average, but the quality in most cases will be less satisfactory than usual.

A few sales of this year's crop have taken place at around 7/6d. per cwt., which compares very favourably with the price obtained at this time last year.

OATS.—The cutting of this crop, which was well under way at the end of August, was brought to a standstill by the heavy rains which immediately followed, and the remainder of the uncut crop, amounting to approximately one-half, suffered further damage from "lodging" and "tossing". That portion of the crop in stooks also suffered from weathering, and considerable losses have accrued through the shedding of the grain when the sheaves were tossed and loosened for drying during the fine days at the end of the month. Sprouting also was frequently noticeable during these operations, and many complaints have been heard of heating in the stack. This necessitated the pulling down of many stacks; whilst in some instances threshing was done hurriedly, in order to save the grain.

Considerable progress has been made with the harvesting and storing of oats, despite the difficulties encountered last month, and only a small portion of the entire crop remains to be gathered in. Early morning frosts and dews

in late September were also a handicap in that they delayed the drying out of the sheaves in stooks, and thus shortened the period available for carting and stacking.

Although the oat crop suffered much injury and loss from last month's inclement weather, the average yield may yet be of normal dimensions, but the quality of the grain and straw in general will be affected. Threshing results so far have illustrated the variability in this year's crop, and it is difficult to make an accurate forecast at present in respect of the yield.

Small supplies of this year's white oats were marketed in the second half of September, and average prices were on a higher level than a year ago at 6s. 3½d. per cwt.

Small quantities of oat straw were selling at local markets during September at around late rates, namely, an average price of 43s. 3d. per ton.

BARLEY.—Harvesting work, which was held up by wet weather in the earlier part of September, was later rendered difficult by "lodging". The handling of this crop generally was slow on this account, but the work was almost completed with comparatively small losses by the end of the month. Here again sprouting was fairly prevalent, and the quality of the grain has suffered from the bad weather.

Threshing has not yet commenced, but fair to good results are expected, and whilst doubts are being expressed as to the quality of the grain in some cases, it is considered that on most farms it will be fair to good.

FLAX.—The major portion of this crop has now been stacked. The pulling and handling of this crop also proved troublesome, as the heavy rains and storms had caused a considerable amount of "lodging" and "twisting". As with the other crops, the weather has depreciated the quality of flax in general, and a fair amount of rotting of the straw took place.

As regards bulk, the green flax was satisfactory, but the yield of fibre will probably be smaller than was anticipated at the growing stage, that is, below the average. So far, scutching operations have been confined to a few areas, and the results generally are less satisfactory than for last year, both as regards the bulk and the quality of the fibre.

Some sales of fibre have been effected at prices ranging from 7/- to 10/- per stone of 14 lb.

POTATOES.—With the harvesting of the grain and hay crops occupying most of the time suitable for outdoor work last month, the lifting of the main crop varieties was done only in the early districts as requirements demanded.

The prospects for this season's crop are, to say the least, generally disappointing. The ravages of the weather and blight disease are now apparent throughout the country, more particularly in low-lying and heavy soil areas, and the yields will be depressed to below the average. Although "blight" was late in making its appearance it was more general than usual, the wet weather at the end of the growing season assisting the rapid spread of the disease. Night frosts also cut down many of the plants, and this terminated swiftly a short growing season. The shortness of the growing period, and the effects of blight, have already been reflected in the smaller tubers which have been dug, and in the percentage of diseased and rotten tubers, which is higher than usual. Reports of soft rot amongst tubers in heavy clay fields and low-lying land have also been received.

In summing up, it may be stated that whilst the area under potatoes increased from 129,000 acres in 1935 to just under 132,000 acres this year, the total of the saleable produce will likely be less than it was last year.

Slightly larger supplies of this year's main crop were marketed last month, as compared with the same month a year ago, and prices were firmer, averaging $3/3\frac{1}{2}$ per cwt. as against $3/0\frac{3}{4}$ per cwt. for September, 1935.

The following shows the trend of average prices at markets where supplies are sold for local consumption compared with a year ago.

Week ended	MAIN CROP—all classes.		Corresponding week 1935	Price per cwt.	
	s.	d.		s.	d.
5.9.36	3	1		3	5
12.9.36	3	7	" "	3	3
19.9.36	3	$4\frac{1}{2}$	" "	2	$11\frac{1}{2}$
26.9.36	3	$2\frac{1}{4}$	" "	2	7
3.10.36	3	$2\frac{3}{4}$	" "	2	$6\frac{1}{2}$
10.10.36	3	$4\frac{1}{4}$	" "	2	$6\frac{3}{4}$

Shipments of potatoes from Northern Ireland increased during the month, but remained smaller than for the corresponding period of last year. During the week ended 3rd October, prices per ton for bagged potatoes paid by shippers ranged as follows :—

Up-to-Date	}	$\pounds 2-10-0$ to $\pounds 3-0-0$
(Red soil)		
Arran Consul	}	$\pounds 2-10-0$ to $\pounds 2-15-0$
Arran Victory		
Arran Banner		
Kerr's Pink		$\pounds 2-5-0$ to $\pounds 2-15-0$

MANGELS.—The crop has made satisfactory growth of late, but on account of earlier setbacks the yield in most instances will be below the average. Lifting had not commenced at the end of September.

TURNIPS.—Although there are some very good fields of turnips, the general impression throughout the country is that this year's crop will be a poor one. Only early sowings and those on light soils are in a promising condition. It is reported that there is a tendency for the tops to develop at the expense of the roots, and that the latter are backward in growth and would require the growing season to continue into the winter to ensure normal-sized roots.

HAY.—Good progress was made during the last fortnight of September with the carting and storing of the hay crop remaining in the fields, and only a relatively small quantity now remains to be stacked. Losses have been heavy this year, but the yield has not suffered so much in quantity as in quality, and only poor to medium quality hay will be available on most farms.

The threshing of seed hay was done on a fairly large scale in the earlier districts, and the results have been better than was expected, although the average yield will be lower than for last season. Up to date the returns of seed have varied between from 4 to 6 cwt. per statute acre.

Increased supplies of hay were marketed last month, and prices cheapened from 66/8 to 65/7 per ton in the case of all classes of upland hay and from 54/11 to 48/- per ton in the case of meadow hay.

Perennial grass seed continued to be marketed in increasing quantities at markets during September. Prices rose steadily during the month, and at the close averaged 17/3 as against 11/9 per cwt. at the corresponding date in 1935. Mixed grass seed also was marketed in increasing quantities, and prices were in the region of 12/- per cwt. as compared with 9/- at this time last year.

LIVE STOCK.

CATTLE.—Stores have made a very good thrive, and the health of cattle generally is good. Dairy cows also have been maintained in a good healthy state, and are milking well, although, with the arrival of colder weather in the second half of September, there was a slight seasonal decrease in the yields of most herds.

There have been no serious outbreaks of disease, but "redwater", which is rather prevalent this year, has caused the deaths of several animals. "Hoose" has also proved troublesome among young store cattle. Calving has been normally successful, only a few cases of abortion having been reported.

The tendency for store owners to fatten off stock on the grass has been discouraged to some extent by the decline in beef values. Large stores of quality have, nevertheless, remained in favour with buyers, whilst trade for small stores has been confined to local graziers. Prices in this section were

generally cheaper on the month, but a firmer tendency was noticeable towards the close. The small numbers of nice young dairy cattle met a better enquiry at improved rates, but otherwise trade in this section was quiet.

SHEEP.—The flocks are in fairly good condition, and there have been no general complaints of disease, but “foot-rot” and “maggoting” appear to have been common complaints.

There were large supplies of sheep at fairs and sales last month, and trade was good for all classes. Prices generally were maintained above those ruling at this time last year.

Another satisfactory feature of this section of the live stock industry has been the higher prices ruling for wool this season.

PIGS.—Fairly large supplies of young pigs were offered at fairs during September, and trade remained quiet at about late rates until near the end of the month when a keener demand influenced prices in the sellers’ favour.

Breeding sows were generally in medium supply and a fair trade, and most of the sales were effected at from £5 to £9 each, but a few good quality second litter animals were making up to £13 each.

HORSES.—A good demand for the best types of horses remained in evidence throughout last month, and prices generally were firm. First class farm and draught horses were selling at from £45 to £55, whilst good types of younger animals, including colts, were fetching from £30 to £40 each. Inferior types of farm horses ranged in price from £15 to £25 each.

MILK.—During the warm weather supplies continued at a high level, but colder weather later brought about a seasonal decline in the milk yield. Creameries were paying slightly higher prices last month, ranging from 3½d. to 4½d. per gallon for milk delivered, the separated milk being returned to the farmer.

The average price paid for milk produced in Northern Ireland and delivered to creameries for manufacturing purposes was 4.41d. per gallon for the month of August, 1936, and the Ministry has made equalisation payments at .59d. per gallon in order to bring the average price in respect of this month to 5d. per gallon as provided by the Milk and Milk Products Act (Northern Ireland), 1934. It should be noted that under the Regulations creameries are required to distribute the equalisation payments in accordance with the butter-fat contents of the milk received from each supplier. Farmers should, therefore, bear in mind that the actual payments made to them, being calculated on a butter-fat basis, may be at a rate per gallon which may vary below or above the average figure herein notified.

THE MARKETS DURING SEPTEMBER.

Supplies of the principal vegetables marketed last month were more plentiful than in August, and prices generally declined on the month. Cabbage were $5\frac{1}{4}$ d. cheaper at $1/8\frac{1}{2}$ per dozen, cauliflowers $10\frac{1}{2}$ d. cheaper at $1/5\frac{1}{4}$ per dozen, leeks $1\frac{1}{2}$ d. cheaper at $3\frac{3}{4}$ d. per bunch, parsley $1\frac{1}{4}$ d. cheaper at 3d. per bunch, carrots $\frac{1}{2}$ d. cheaper at 3d. per bunch; whilst parsnips were unchanged in price at 4d. per bunch. Fair supplies of savoys were marketed during September, and averaged $1/9\frac{3}{4}$ per dozen, whilst garden turnips were in good supply at Belfast and averaged 7d. per bunch.

Farmers' print and lump butters were more plentiful than in August, and prices tended firmer at $1/2$ per lb. for print and $10\frac{3}{4}$ d. for lump butter. Hen and duck eggs increased in supply on the month and prices hardened. Hen eggs averaged 10d. per lb. as compared with $9\frac{3}{4}$ d. in the preceding month, and duck eggs averaged $10/8\frac{1}{4}$ per 120 as compared with $9/5$ per 120 in August.

In the poultry markets hens, chickens and ducks were more numerous than in August. Hens were firm in price at an average of $1/6\frac{1}{4}$ each, but chickens cheapened by $1\frac{1}{4}$ d. and ducks by $1\frac{1}{2}$ d. to an average of $1/10\frac{1}{2}$ each.

Decreased supplies of wool were offered, and whilst long unwashed wool was $\frac{1}{4}$ d. cheaper at $6\frac{3}{4}$ d. per lb. mountain unwashed wool was stationary in value at 6d. per lb.

THE COST OF LIVING INDEX FIGURE.

The cost of living index figure at 1st September, 1936, was 47, or one point above that for the previous month. The figure at 1st September, 1935, was 43.

THE SIXTH WORLD'S POULTRY CONGRESS AT LEIPZIG.

NOTES ON SOME OF THE REPORTS AND PAPERS PRESENTED.

(Contributed by J. G. Rhynehart.)

In all there were 16 general reports and 144 papers read at the Congress Sessions. Fourteen of the sixteen general reports were on subjects of interest to the poultry keeper, including organisation, breeding, incubation, nutrition and disease. Of the 144 papers, all except nine, which dealt with rabbits, were on poultry keeping subjects.

The general reports were presented during three sessions in a room fitted with a special telephone apparatus by which each member could hear, through head 'phones, each report in the official language he desired, if the particular speaker was communicating his report in a language the speaker did not understand. This arrangement was made possible by the interpreters translating the report, as it was being given by the speaker, into the four official languages other than that being used by the speaker, and transmitting the translations on separate telephone systems to the head 'phones.

The papers were read at two Sessions, each of which was of about four hours' duration, and for the purpose of hearing these papers the Congress divided into six Sections. Thus, the papers relating to the following subjects were communicated to the respective Sections stated:—

General; Instruction; Organisation—Section 1.

Physiology of the Egg; Physiology and Feeding of Poultry—Section 2.

Hatching, Rearing, Breeding and Heredity—Section 3.

Hygiene and Disease—Section 4.

Questions of Economics—Section 5.

Rabbit Breeding—Section 6.

Unfortunately, at the two paper reading sessions the programme was found to be so heavy as to leave little time available for discussion, and in many cases no discussion followed the reading of a paper. It was felt by many of the Congress members that the impossibility of finding time for discussion was a distinct disadvantage which, if at all possible, should be remedied at future Congresses either by restricting the number of papers or allocating more time for their presentation.

The reports and papers of particular interest and value are reviewed in this article with a few relevant comments interspersed.

REPORTS.

The report of outstanding interest was that by E. T. Halnan, of Cambridge, on "The Role of Minerals in Poultry Nutrition". In this report, the work and results of workers on the subject throughout the world were reviewed, and a summing up of the present knowledge of mineral metabolism as it relates to poultry was made. The following are some of the conclusions reached by the author:—

- "(1) Errors of mineral metabolism due to faulty feeding give rise to pathological conditions in early chick life.
- (2) The need for mineral supplements during rearing may arise from the time the chicks are 8 weeks old.
- (3) Calcium (the base of limestone and oyster shells), chlorine and sodium (the constituents of common salt) are important minerals for growth as well as for egg production.
- (4) Foods of plant origin are deficient in chlorine and sodium and, with the exception of the clover meals, in calcium also; these deficiencies may be largely compensated by including foods of animal origin in poultry dietaries.
- (5) For satisfactory chick growth (a) the amount of calcium required will decrease as the Vitamin D content of the diet is increased, (b) under optimum (the best) conditions, satisfactory growth will be obtained without additional supplements of calcium and phosphorus, (c) the addition of large amounts of calcium in the form of calcium carbonate will unfavourably affect calcification, owing to the depletion of phosphorus needed for the excretion of the excess calcium, (d) the addition of large amounts of phosphorus, particularly in the form of bone meal, will adversely affect chick growth, owing to the production of perosis (slipped tendon) which, as well as the condition known as rickets (leg weakness) is caused by a wrong balance as between the calcium and phosphorus".

From these conclusions it would seem therefore:—

- (1) That there is little risk of a shortage of the essential minerals if foods of animal origin are included in suitable proportion in the dietary, and calcium in the form of oyster shell and limestone grit is provided.
- (2) That there is a definite objection to the incorporation of mineral mixtures, which include calcium with the mash, as by so doing an excess of calcium may be eaten by the bird and derangements caused by upsetting the balance between the calcium and the phosphorus thereby induced.
- (3) That, similarly, the incorporation in the mash of mineral mixtures containing bone meal should not be practised.

In a report on "A comprehensive breeding programme for the development of high laying strains", Morley A. Jull, of America, showed:—

1. That mass selection is relatively ineffective in improving egg-laying ability in flocks.
2. That the records of egg production are of limited value in selecting breeding stock.
3. That there is a general inclination to attach entirely too much significance to individual records of egg production.
4. That better progress in breeding for increased egg production and other characteristics would be achieved if more attention were paid to pedigree, and especially to progeny testing.

These conclusions are supported by the results at the laying tests, and by the experiences of practical poultry keepers who have paid dearly for the mistake of selecting their breeding stock solely on the basis of egg production. Progressive poultry breeders everywhere are now beginning to realise that in a strain of birds selected and bred for egg production, high individual egg records are, as Jull states, "of limited value", and that the sane method by which the breeding value of a bird should be judged is through the medium of the number, quality and production of the progeny.

SECTIONAL PAPERS.

Section 1.—GENERAL, INSTRUCTION, ORGANISATION.—A paper by W. Kennedy, of England, on "Chick Sexing by the Vent Method", was the only one on that subject, but a Japanese expert demonstrated the process to the members of the Congress at a special session. Kennedy reviewed the rise and development of chick sexing and of the method by which it is controlled in England by the National Poultry Council. He also indicated that another form of sex determination was being experimented with by an English scientist who claims that his experiments are showing that by the process he has evolved, the sex of chickens can be determined prior to hatching. This process is still a secret.

In connection with chick sexing by the vent method the writer of these notes had the privilege during the Congress of discussing the desirability of this practice with a leading hatchery man from America who stated that, although at one time he adopted the method, he is now definitely opposed to it and has ceased to practise it except when requested specially to do so. Instead, he is developing strains of White Leghorns which are capable of producing chicks that can be sexed successfully by inspection of the primary feathering of the wings when one day old. He is hoping to develop strains of Rhode Island Reds and Barred Rocks having similar capabilities.

Macdougall, of England, in a paper on "Laying Trials", made a strong plea for the elimination of the "reserve bird" principle from trials as a practical step in the efforts to reduce mortality, and mentioned that another step might be the publication in the Register of Records against the names of the owners of the copper ring birds entered, of the relevant particulars of mortality amongst the birds entered in the trials by each owner.

Jensen, of Denmark, described the Danish Scheme for the registration of male birds in the "Official Breeding Book for Cocks". This Register is based on the results of the laying trials on the State farm at Faurholm. A point of interest is that each strain is given a proper name in the Register so that the different strains may be identified and traced readily.

Several papers in which the writers described the poultry improvement schemes in their respective countries, and indicated the development which has taken place in the industry, were presented.

Papers by Jaeger of Germany, Kamseder of Germany, and Weiss of Germany, on "The Training of Pupils in Poultry-keeping", "The Poultry Advisory System", and "The Advisory System and its Results", respectively, in Germany, were particularly interesting as they permitted a comparison being made between the practices in Germany and in this country. The principles governing the training of pupils in poultry-keeping in Germany are founded on the stipulation that such training shall be uniform in character. Accordingly, the training can be obtained only at authorised educational Institutes and schools. The period of training for poultry Attendant, which is the lowest grade of training recognised, extends over two years, of which one year must be spent at practical work in agriculture, including housework for women pupils, and the other at practical work at one of the authorised educational poultry breeding establishments. There is also a course of training for those who wish to qualify as Assistant. This comprises two years at an authorised educational establishment followed by a term of three months at a poultry experimental and educational Institute, and is the course of training taken by those who wish to qualify for appointments as Adviser in Poultry-keeping to the Peasants. Pupils who complete the assistant's course and pass the examinations, who can produce evidence that they have completed four years of practical work and one year of training at an educational and experimental poultry institute, and who are more than 25 years of age, are eligible to take the examination for qualification as senior poultry-keeping Instructor, or Inspector. There is now a keen demand in Germany for trained pupils.

Kamseder, in dealing with the poultry advisory system, emphasised the following points:—"Success in giving advice depends almost entirely upon the personality of the adviser, whether man or woman. The adviser must

gain the confidence of those to whom he is giving advice, and any suspicion of unnecessary interference must be allayed. The nature of the advice given must always be applicable to existing circumstances. To make the objects of the advisory work known, public meetings should be held and opportunity taken there of giving technical advice. Poultry breeders who appear to be interested should be visited frequently and efforts made to encourage them to run their farms on better lines. The inspection of poultry farms is of great value and importance, and opportunity should be taken of pointing out the difference between poultry farms which are backward and those which are established on modern lines. The adviser must continually emphasise the necessity for economy. The adviser should never approve of the extension of a poultry farm beyond its normal capacity”.

Weiss gave some very impressive results of the present advisory system which has been in operation since the autumn of 1933, and at the same time outlined the principles which should govern advisory work. Germany is divided into six districts for the purpose of the advisory scheme for peasant poultry keepers, and these are again sub-divided to form small districts, to each of which an Adviser is allocated. During the past three years 235 new poultry houses have been erected and 194 existing ones altered to make them suitable. Twice as many day-old chicks and young pullets have been purchased by peasant poultry-keepers in 1935 as in 1934. A common fault amongst the poultry-keepers was the retention of hens until they became too old to be profitable. To discourage this practice, all new birds must now be ringed when purchased so that their age will be known. Poultry-keepers are being advised not to retain hens longer than 3 years.

Section 2.—PHYSIOLOGY OF THE EGG ; PHYSIOLOGY AND FEEDING OF POULTRY.—In a very interesting paper on "The Protein requirements of Laying Hens", G. F. Heuser of Cornell University, America, discussed the results obtained from a two years' test with White Leghorns. Three groups of birds, fed on rations containing respectively 12%, 14% and 16% total protein were included in the tests. Each group received the same basal ration of 45 parts maize meal, 20 parts wheat flour middlings, 10 parts bran, 10 parts ground oats, $3\frac{1}{2}$ parts oyster shell flour, 2 parts calcium diphosphate, $\frac{1}{2}$ part iodised salt, and 1 part cod-liver oil. Commercial casein was added to the basal ration in quantity sufficient to bring the total protein content of the ration for each group up to the figures stated above. The high and low protein groups were reversed once during the first year's experiment and every 10 weeks during the second. The following were the general conclusions arrived at by Heuser:—

“With commercial casein as the supplementary source of protein in rations containing 12%, 14% and 16% total protein—

- (1) The 16% protein ration resulted in satisfactory egg production, body weight and egg size.
- (2) The 14% protein ration gave satisfactory egg production but did not maintain body size, except when production was not at its highest, and was not conducive to best egg size.
- (3) The 12% protein ration was not sufficient for satisfactory egg production, body weight or egg size''.

In connection with these results it is of interest to note that in another paper read at the Congress, Baelum of Denmark, communicating the results of his work on the amount of protein needed by laying hens, recommended that the meal ration should contain 16 per cent. of digestible protein to satisfy fully the requirements of the birds. The results from both these investigations would appear, therefore, to be in conflict with those obtained at Hillsborough where a ration containing only about 13 per cent. of total protein with $\frac{1}{2}$ per cent. of common salt, was satisfactory, but it is to be noted that in experiments at Greenmount College, the same ration as was used at Hillsborough did not maintain egg size and body weight.

A clue to this apparent conflict in results may be found in work done at Erding, Germany, and reported to the Congress by Weinmiller, the Director of the District Poultry Breeding Institute of Upper Bavaria. Weinmiller investigated the value of pasture land for poultry and found that with Leghorn hens on open pasturage there was a saving of 40.8 per cent. in protein food as compared with birds which were confined. The birds used by Heuser were kept in individual cages which were placed in a room throughout the test period, and therefore did not obtain any benefit from pasture. Baelum's estimate of the protein content necessary was determined from data obtained at the State farm at Faurholm, but it is not clear whether or not the birds had access to open pasture. The birds in the experiments at Hillsborough and Greenmount had access to grass runs.

Biely, Lloyd and Chalmers, of Canada, reported their findings regarding pilchard oil as a source of Vitamins A and D for poultry. They found that $\frac{1}{2}$ per cent. of the oil added to the ration ensured normal bone calcification, and that biological tests with rats showed this oil to be a very potent source of Vitamin D. Practical feeding tests confirmed the conclusion reached through laboratory experiments in showing that pilchard oil is a rich and economical source of Vitamin A, and that for poultry feeding its Vitamin A content equals that of cod-liver oil. They recommended $\frac{1}{2}$ per cent. of pilchard oil in the ration for growing chicks and 1 per cent. for laying hens.

Reporting on tests to determine the value of skimmed milk for poultry, Fangauf of Germany reached the following conclusions :—

- (1) Hens will consume on an average 250 grams (approximately three-sevenths of a pint) of skimmed milk each, daily, if they have no other drink available.
- (2) This amount is not necessary for best results, one-fifth of a pint each, daily, being adequate.
- (3) Hens drink about an equal quantity of milk and water, respectively, when both are available.
- (4) When up to one-sixth of a pint of milk per hen is given daily, the addition of fish meal or other protein supplement will not increase production.
- (5) The amount of mash consumed decreases as the consumption of milk increases.
- (6) The feeding of milk to breeding stock had a good effect on hatching and rearing.
- (7) Milk, instead of other protein food, produced normal and healthy growth in young chicks.

The results from this investigation support the general policy adopted in Germany in regard to the nutrition of poultry, namely, the utilisation of milk produced on the farms as the source of protein.

The relative suitability of wheat, oats, barley and rye as grain food for laying hens has been investigated by Jaeger of Germany. He found wheat to be the best of the four cereals, and oats nearly of equal value. Barley was the least satisfactory, although eaten more readily than the rye. The results of this work have also a bearing on the policy being pursued, since supplies of all the cereals tested are produced on the farms.

In an experiment on the feeding of 12 months' old birds on various rations, including one which consisted solely of maize, which was conducted by three Roumanian workers, the results showed that 90 per cent. of the birds fed on maize only died, proving that maize in itself is not adequate to sustain life.

Usuelli of Italy, in a paper on "The Influence of the Proteins on the digestibility of Cellulose (fibre) by Chickens", showed—

1. That an increase in the proportion of proteins included in the food is followed by an increase in the digestibility of the raw fibre of the food.
2. That this increase in the digestibility of the fibre is produced chiefly by the proteins of animal origin.
3. That of the proteins of animal origin, those in meat meal are superior to those in casein as aids to the digestibility of fibre.

4. That under certain conditions the proteins of animal origin create in the digestive tract of the bird conditions which are favourable for the development of bacteria, and that, in particular, they may serve as nutrient material for the bacteria which make fibre digestible.

Section 3.—HATCHING, REARING, BREEDING AND HEREDITY.—There were 25 papers in this section, but only those of particular interest or application to this country will be referred to here.

Pease, of Cambridge, reviewed the work done there in connection with the making of the Cambar breed of poultry which is self sex linked; that is, a Cambar male mated with Cambar females will produce chickens, the sex of which can be determined by inspection at the time of hatching. He gave directions for the making of new auto-sexing breeds, and discussed some of the difficulties of doing so and the practical limitations of the application of the principles generally. The Cambar is a Golden Campine with the barring factor added.

Hagendoorn, of Holland, reported the production by him of two new breeds, namely the auto-sexing Barnevelder and the auto-sexing Brown Leghorn. Both were produced by adding the barring factor to the ordinary Barnevelder and the ordinary Brown Leghorn. When males of either of these new breeds are mated with females of the same breed the cockerel chickens on hatching have white or whitish coloured down, while the pullet chickens have brown coloured down. Hagendoorn is now engaged on the production of an auto-sexing Rhode Island Red breed.

To make an auto-sexing breed, a gold or brown breed is necessary. The production of auto-sexing strains of White Leghorns in which the rate of feathering of the wings of the chick is the basis on which sex is determined is, therefore, of particular interest. Such strains have been developed by Gholson, a hatcheryman of Illinois, with whom the writer had the privilege of discussing the discovery. With few exceptions all White Leghorn chicks feather quickly, that is, the primary wing feathers are visible at the time of hatching. The exceptions are always pullet chicks. The problem, therefore, resolved itself into producing a strain of White Leghorns in which the cockerel chicks had the slow feathering factor. This was done by crossing the Leghorns with males of a heavy breed having the factor desired, and then breeding out the other characteristics of the heavy breed which appeared. Slow feathering and fast feathering are sex linked characters, so if a cock having the quick feathering factor is mated with a hen having the slow feathering factor, the pullet chicks will be quick feathered and the cockerel chicks slow feathered.

The results of experiments on sex determination in chicks by the use of colour reactions were reported by Kupsch of Germany. In these experiments

blood extracts, liver extracts and droppings extracts of individual chicks were treated with methyl-green in the hope of obtaining colour reactions which differed in the case of the cockerel chicks from those of the pullet chicks. The method was found to be quite unreliable.

Smith and Branion, of Canada, contributed one the most important papers in this Section. It dealt with the effects of certain protein supplements on the hatchability of eggs. It was found that good hatchability resulted, irrespective of the nature of the protein supplement, when the breeding birds had access to good grass range, particularly during periods of sunshine. These conditions are not always available during winter and early spring, when an increasing amount of hatching is now done and, accordingly, it is of major practical importance to determine what food supplements shall be fed so as to make good the absence of fresh grass and of sunshine. It was demonstrated that a cereal ration, even when fortified with iodised salt and cod-liver oil, which contained fish meal or meat meal as the protein supplement, was not satisfactory; and that for breeding stock neither fish meal nor meat meal was an efficient substitute for grass range and sunshine. When a mash containing fish meal or meat meal was fed to breeding birds denied grass range the hatchability of the fertile eggs was very poor, but when buttermilk powder was used instead of the fish meal or meat meal the hatchability improved markedly, and was better still when liver extract was included in addition to the powdered buttermilk. When buttermilk alone was the protein supplement it was included at the rate of 14 per cent. of the ration. The liver extract was that prepared for use in the treatment of pernicious anaemia, and three grams are obtainable from one-third of a pound of ox liver. When fed at the rate of $1\frac{1}{2}$ grams per bird weekly it increased the hatchability except where milk was the supplement, but when fed at the rate of 3 grams per bird weekly the hatchability was increased still further even where milk was fed.

The authors of the paper reached the following conclusions:—

1. Liver and milk, or grass range furnish an essential factor or factors for high hatchability. Fish meal and meat meal are deficient in respect of this factor.
2. Summer sunshine and grass range conditions are important factors in hatchability.

Some of the conclusions reached by Roberts and Card, of America, in a report of their work, which has been in progress since 1924, on a genetic study of resistance and susceptibility of chickens to pullorum (*Bacillary White Diarrhoea*) disease were:—

1. Selection was effective in producing strains of the domestic fowl which were more resistant to infection than those of unselected flocks.

2. The selected stocks were consistent in maintaining resistance through successive generations.
3. The birds produced by crossing resistant and susceptible stock were as resistant as the resistant parents.
4. A susceptible male mated to susceptible females produced progeny which were much less resistant than were the progeny of the same male mated to resistant females.
5. Resistance is dominant to susceptibility.

In a paper on "Inbreeding in the White Leghorn Fowl", Waters and Lambert, of America, reported that while there was no general or significant increase in the mortality during the first eight weeks after hatching, the pullet year mortality showed a rapid increase as the intensity of inbreeding increased despite the fact that a very rigid selection of the breeding stock was made; also that there was a general but not a consistent decrease in the number of eggs laid during a given period as the in-breeding progressed. In general, the results of this study confirm the suggestion that in-breeding leads to deterioration in constitutional vigour and stamina.

It is of interest to note that a large hatchery man in America has now adopted the practice of transferring the eggs on the nineteenth day of the hatch from incubators of the forced draught type to those of the ordinary type, as this has been found to be a definite aid in controlling the incidence of pullorum disease.

Section 4.—HYGIENE AND DISEASE.—Of the 29 papers presented in this Section a most important one was that by Dalling and Warrack, of England, on Fowl Paralysis (Lymphomatosis). Some of the findings recorded are:—

1. Lesions of lymphomatosis may be found in practically all tissues, including those of the nervous system. Lesions may occur only in the nervous tissues or in other tissues or in both in the same bird.
2. Intestinal parasitic infestation plays no essential part in the causation of lymphomatosis in fowls.
3. Evidence of the disease being present may be found in birds varying in age from 2 months to over 27 months. In the older affected birds there is evidence that the condition did not occur at an earlier age.
4. Some strains of birds appear to be more readily "susceptible" than others.
5. There is no evidence that lymphomatosis is transmitted by contact of potentially affected chicks or affected adults with healthy young chicks.

6. Breeding experiments showed that—

- (a) Incubation and rearing play no part in the causation of lymphomatosiis for all hatches were treated similarly and the incidence of disease in them did not differ materially.
- (b) The different cockerels used seemed to play no significant part in the resulting incidence in their progeny.
- (c) Groups of pullets selected for apparent "susceptibility" and "resistance" to lymphomatosiis failed to furnish clear evidence of these qualities in their progeny.
- (d) Pullets in whose ancestors lymphomatosiis has existed to a marked degree, do not necessarily produce affected progeny, but, on the other hand, pullets in whose ancestors there is no evidence of lymphomatosiis may produce progeny in which the condition occurs to a marked extent.
- (e) Infected dams do not always produce affected progeny.
- (f) Pullets producing most cases of the disease in their offspring have remained healthy, and birds in all stages have failed to transmit the disease.
- (g) Lymphomatosiis seems to be a condition associated with individual birds.

These workers suggest that future work on lymphomatosiis should include a study of the types of birds from which to breed in order to prevent its occurrence in the progeny.

The discussion on this paper was long and interesting. While there were conflicts of opinion amongst the workers from different countries, it was evident that all considered it to be of the utmost importance to the industry to pursue research work on lymphomatosiis with the greatest possible vigour.

Geurden, of Belgium, also contributed a paper on lymphomatosiis and leucosis. He concluded that the treatment of the disease has at the present time a theoretical value only, and emphasised the following points: "The conditions which give rise to this disease must be further studied, and already known causes, such as parasites, chicken infections and excessive exploiting of poultry, must be energetically combated. Poultry units in which there is a tendency to susceptibility to this disease should never be used for breeding purposes".

In a further paper dealing with fowl "paralysis", Seifried, of Germany, distinguished between paralysis resulting from improper nutrition and that which he described as being of an infectious nature. In the case of paralysis

caused by improper nutrition, including a deficiency of vitamins, or an excess of protein food, degeneration of the nerve centres and the muscular system takes place, while lymphomatosis causes anatomical inflammation primarily.

Dobberstein, of Germany, submitted that lymphomatosis bears in its whole general character a great resemblance to the contagious tumours and leucosis prevalent amongst poultry, and that the pathology at the basis of this disease has apparently no connection with real neuritis, but is primarily a malignant growth in the nerve centres, leading finally to partial or total necrosis (death) of such tissues.

In a paper entitled "Practical Experiences in Combating Fowl Paralysis", Fritzsche, of Germany, concluded that hygienic measures are of first importance. He stated that birds which are suspected of having the disease must be carefully weeded out, and that in this way only can the flocks be preserved from infection; he also advised that new broods of chickens should be segregated from the remainder of the flock and reared on fresh land which is apart from that on which the rest of the poultry are running.

It is evident from the findings reported, and the opinions expressed by the various workers on fowl paralysis (lymphomatosis), that the fringe of the subject only has as yet been touched and that much investigation still remains to be done before various points on which there is now a conflict of opinion are elucidated to the satisfaction of all.

There was only one paper on Bacillary White Diarrhoea (Pullorum) disease, and this was contributed by Burriss and Roberts, of America. In it the "Livability results in chicks from flocks tested for Pullorum disease by the standard tube agglutination method" were reviewed. It was found that with flocks retested on a four to six weeks' basis there was a decided increase in the number of broods and chicks in which the losses during the first three weeks of brooding were less than 5 per cent.

Te Hennepe, of Holland, in a paper entitled "Observations on combating disease of poultry in Holland", concluded that the three main causes of the increase in lack of vitality in poultry are:—

1. Breeding from pullets.
2. Insufficient knowledge of the proper food for heavy laying birds, especially as regards vitamins and minerals.
3. The practising of artificial methods.

Section 5.—PAPERS ON SUBJECTS CONCERNING THE ECONOMICS OF POULTRY-KEEPING.—The majority of the twenty papers submitted to this Section of the Congress dealt with matters relating to specific work, conditions or practices in the countries of those who presented them.

Grzimek, of Germany, described the methods in operation in that country for controlling the marketing of eggs. All eggs for the wholesale trade must be graded and marked in conformity with uniform legal designations. The supervision of this work is done in the first instance by the National Food Producers' Organisation at the officially recognised Packing Centres, and, secondly, in the large towns where samples are taken at random from the supplies received. Penalties are inflicted in respect of supplies which are below the average standard of quality, while premiums are paid to the testers and packers of cases found to be in first class condition. In 1935 the number of inspections made at Packing Centres was 4,267, while 21,678 consignments ready for distribution at the places of receipt from the Packing Centres were examined. In 5,906 instances penalties were inflicted, and in 2,492 premiums were paid. As a result of the strict supervision a progressive improvement is noticeable in the general standard of German eggs.

The production and distribution of eggs in Norway was the subject of a paper contributed by Svendsen, in which the following particulars were given :

1. The production of eggs is carried out under the best and healthiest conditions.
2. The average egg production per hen has increased from 80 per annum in 1890 to 120 in 1935.
- 3 The total production of eggs in Norway in 1890 was 3,520 tons, while in 1935 it was 21,561 tons.
4. The measures taken for the improvement in the quality of eggs are highly organised.
5. The producers, who are members of the Norske Eggcentraler, are paid for their eggs on a quality basis.
6. The expenses incurred in the testing and grading of eggs have been reduced as a result of the operation of a co-operative system of distribution.

Dennis and Dinsdale, in a study of "The Economics of Egg and Table Poultry Production in England", as founded on the results of a five years' investigation of the financial and economic experiences of representative British egg farmers, stated that "poultry farming is still a speculative business in which there are many possibilities for improvement in production efficiency". They found that individual farmers made a profit while others suffered a loss, and indicated that the net returns from poultry-keeping in any particular case are governed by a combination of many factors, including the size of the unit, the level of egg production per layer, the rate of mortality, the efficiency of the methods of flock replacement, feeding technique, and a proper appreciation of selling opportunities. Their data showed that under

English conditions the most profitable flocks are either under 200 or between 600 and 800 adult birds. The small flock is under the personal supervision of the owner, and this seems to be the reason why such a flock is usually most profitable. Flocks of between 400 and 600 birds are less profitable than those containing between 600 and 800, because, until the size of the flock reaches the latter level, the owner cannot afford to employ efficient hired labour, and, accordingly, as the flock size increases beyond that at which detailed personal supervision is possible, the efficiency of management decreases. The average profit per adult laying bird per year in the case of 62 flocks each containing less than 200 and comprising in all 7,917 birds, during the laying years 1931/32 to 1933/34 was $5/5\frac{1}{2}$ d., while the average profit per bird per year during the same three years, of those in 42 flocks, each containing from 400 to 600, and comprising in all 21,146 birds, was $2/8\frac{1}{4}$ d.

It was found that a flock averaging approximately 450 layers over the year on a farm run on the usual systems of home hatching and rearing of stock for replacements is about what one man may be expected to manage without having recourse to hired labour.

The Wax Method of Plucking Poultry was described in detail in a paper by Heitz, of America, who claimed that the advantages of the method were:—

1. A more thorough and satisfactory job can be had than by most hand-picking.
2. The removal of the pin feathers by wax means that the skin is not damaged as may happen in the case of hand-picking.
3. Singeing is not necessary, as practically all the hairs are removed with the wax.
4. Most of the dirt on the skin is also removed with the wax, and wax-plucked birds have a clean appearance by reason of the skin being glossy and possessing a velvety finish or "bloom".
5. There is a saving in labour cost as compared with the usual methods. In some cases the saving may be as high as 50 per cent., but the average range may be from 25 to $33\frac{1}{3}$ per cent.

Ulmansky, of Yugo-Slavia, reported the results of tests carried out to compare the suitability for that country of three breeds of poultry, namely, Styrians, Rhode Island Reds and Plymouth Rocks. The Styrian is a new Austrian table breed, specimens of which created much interest in the live stock section of the Congress. The birds of this breed appear to have unique table qualities and to be very vigorous.

Ulmansky was able to make the following conclusions from the results of his tests:—

1. The Styrian fowls being native to the soil, grow more quickly, especially when young, and mature earlier than Plymouth Rocks and Rhode Island Reds.
2. They are excellent table birds and are ready for market in from 1 to 3 weeks less time than Plymouth Rocks and Rhode Island Reds.
3. They are capable of greater resistance to climatic conditions, utilise their food better, and are, therefore, more economical to feed than the other two breeds.
4. The weight and number of eggs laid by Styrians compare unfavourably with the production of the other two breeds, but there is evidence to deduce that these qualities could be improved considerably.

TOWARDS A MORE STANDARDISED SYSTEM OF PIG BREEDING.

(Reprint of Talk by H. G. Robinson, Esq., M.Sc.)

The interchange of ideas in regard to farming practice is probably one of the best means of ensuring progress. We are apt, sometimes, to regard our own particular efforts as being adequate until we are awakened to the realisation that there are good ideas apart from our own, and that the adoption of other methods may on occasions prove to be very much to our advantage. It would be wrong to assume, however, that there is only one golden rule to success, and that is why one has to be so extremely careful in delivering advice and guidance to fellow agriculturists. In farming we have so many differing factors to contend with, that the dogmatist is very quickly out of his depth, and out of sympathy with his audience.

The foundations of successful agricultural practice are fairly well defined, and constant. It is in respect of the superstructure that one finds scope for the display of individual genius, and fortunately this helps to make farming more interesting by reason of the variety that can be introduced.

I purpose confining myself to the foundations of successful pig husbandry. At the outset I should like to emphasise that my own conception of successful practice in any branch of Agriculture is that it should be both logical and reasonably fool-proof. There may be some element of gambling in successful practice, but I suggest that if one is equipped with the knowledge that by following a clearly defined course a certain goal will be reached, then some point and purpose is introduced into our farming practice.

The incentive to concentrate on a definite farming policy has been increased in recent years by reason of the establishment of various marketing schemes. Some of these schemes have done a great deal towards standardising production and creating confidence, but they have also demanded that the support given shall be in accordance with the requirements of consumers in respect of quality. Whether we like it or not, agriculturists are no longer free agents as regards farming practice. In a world where competition is becoming increasingly keener, the upper hand is that of the purchaser of agricultural commodities, and the producer who is not listening to his master, is doing a grave injustice to himself and losing business to those who are willing to satisfy requirements. In the days when competition was not so keen, one could follow one's own whims and fancies without serious economic consequences, but this is no longer true. Those who have rooted prejudices have to recognise the inevitable or suffer the consequences.

In no branch of Agriculture have greater changes taken place than in pig-husbandry. The incentive in this case has quite justly been the payment of premiums for quality. It is an old argument that the standard price for any commodity should be for the best of its class, but in common with those in other industries, agriculturists have a right to claim some premiums for quality. What we have got to recognise increasingly is that our efficiency as producers of commodities for home consumption has to be on a higher plane than that of our competitors who are probably only exporting a standardised high class article, while retaining the other grades at home. There has been in the past a tendency for breeders to disregard the requirements of the bacon curers on the grounds that the producer's interest in his produce ends when his pigs reach the factory. This is not strictly correct, for the prosperity of producer and curer alike depends on the creation of a healthy demand from the consumer. Producers who are suspicious of the intentions of the curers are doing an injustice to themselves, for the ideal is an industry that is united in all essentials.

It is recognised on all sides that beneficial changes have taken place in recent years as regards the type of pig that is being marketed for bacon, and this is a tribute to the common-sense policy that pig farmers are applying to their practice. There was a time, and no great distance separates us from it, when the last concern of the breeder of pedigree stock was the economic properties of the breeds in question. We were influenced by such factors as colour and various fancy points that were supposed to be characteristic of a particular breed, and these same points claimed more attention from breeders than the ultimate purpose of the breed. Fortunately, we are now on much sounder ground, in that we are compelled, if we would safeguard our economic well-being, to put economic qualities first of all, and other points second.

It might be well if I remind you of the economic qualities that I regard as

supremely important in a progressive system of pig-breeding. In doing so I purpose to draw on my own experience gained at the College to which I have the honour to be attached. Some years ago when we started pig-breeding on a serious scale—and this was before the days of bacon schemes—we were at a loss to know which was the best breed of pigs. At the time there were four breeds in particular that were claiming much support amongst pig fanciers, viz., Large White, Middle White, Large Blacks and Berkshires. It was felt in order to meet the demands of teaching future agriculturists that all these breeds should be kept, and consequently a start was made with representative breeding sows of each breed. Open-air pig-keeping was then considered the proper thing to do, and animals were selected from stock that had been raised under this system of management. After a few years' experience of the response of the various breeds to the system of pig-keeping that we were following, it became obvious that on a basis of behaviour, we were getting better results from Middle Whites and Berkshires than from the other two breeds. Consequently, we dropped Large Whites and Large Blacks, and continued with the two short-nosed breeds. The factor that culminated our decision was that of relative hardiness and capacity for thriving under the conditions that obtained. Later we were forced to cut down our interest in Berkshires, on the grounds of fecundity deficiencies.

We were, however, very quickly reminded in consequence of the change over to Middle Whites that hardiness, good mothering and breeding properties were only part of the problem of pig-breeding, for the buyers of our pigs complained that they were too fat for modern tastes. When pigs are scarce one might get away with the disregard for buyers' comments, but when buyers have a choice—and I am concerned with pre-pigs scheme days when there were no quality premiums—buyers themselves fixed the quality premiums by not being prepared to pay good prices except for quality produce. It can of course be argued that if one's stock live cheaper, breed better and feed quicker, then one can afford to take a lower price even if the quality is not so good as it might be. This view-point, however, did not impress me, as I felt that continual complaints suggested that something was seriously wrong. Thereupon we embarked on a policy of crossing our Middle White sows in order to retain a suitable type of dam that had proved satisfactory.

Our first choice was the use of the Tamworth boar. According to the literature of the period, the Tamworth was considered to be the leanest cutting pig in existence. It was popularly supposed to be a somewhat slow-maturing breed by reason of its propensity for producing lean meat. Similarly its general conformation suggested that it would be just the animal to counteract the excessive tendency to fat production that characterised the Middle Whites. The results of this crossing over two years indicated that an improvement had taken place in quality, but still not sufficient to make buyers

satisfied with our efforts. Quite frankly I am not impressed by the lean-cutting reputation of the Tamworth, and cannot recommend it as a suitable cross with the Middle White if high-class quality is desired.

Our next efforts at quality improvement were to use Large White boars, and immediately we obtained the response that was desired, and with this change—compliments from our pig buyers began to pour in. It soon became obvious to me that while cross-breeding had many points in its favour, the production of the necessary Middle White sows for entering the breeding herd necessitated producing other pigs not fit for breeding from, that would have to enter the commercial feeding market, and which would not rank as good quality animals. Hence quality claimed pride of place as the first essential in our pig-breeding policy, and we once again laid the foundations of a Large White herd to breed pure-bred pigs. I might also add that in some measure we were influenced along this course by the prospect of some bacon-pig production scheme materialising which would thereby necessitate further concentration on the quality aspect.

Our foundation stock of Large White breeding sows was drawn from two sources, and consisted of two gilts of one family which I will call (A), and four gilts of another family, which I will call (B). This was 6 years ago, but as a point of interest to breeders I might mention that of the (A) family no less than 57 gilts have been kept for breeding from in our own herd, as against 8 gilts of the (B) family. In one sense this is a good example of natural selection and the differing behaviour of families in respect of breeding capacity and type. "A" family is very prolific and make wonderful feeders, whereas "B" family has been a little more uncertain, though probably more in accordance with modern bacon requirements than the other so far as type is concerned.

In our case the change to pure-bred Large Whites has been attended by perfectly satisfactory results, and after a good experience with a representative sample of pigs of many breeds and crosses I should not be in favour of altering the present policy, simply because I attach first importance to satisfying those who buy the finished product; where a self-supporting breeding herd is kept there is everything to be said for the pure-bred rather than the cross-bred, with the additional advantage that the selection of breeding stock can be undertaken on a progressive basis. Over and above this it is wrong to assume that one's difficulties end with a change of breed, or that there are no new problems to be tackled. The evidence is fairly conclusive that it is not so much "breed" as such that matters, but the "strain" within the breed. Our business as breeders of pure-bred stock is to find within our herds those animals that adhere to the following requirements:—

1. True to the type which we conceive to be satisfactory for market requirements, and which is supplied by grading results in the particular strain concerned.
2. Good feeders—which is supported by capacity to reach bacon weight in reasonable time.
3. Good breeders—which is supported by fecundity records, weaning weights (index of milking) and the general reputation of the dams for docility.
4. Good constitution and general ability to thrive under the localised conditions that obtain.

“Constructive breeding” or “breeding with a purpose” is very distinct from the system of breeding that follows the line of least resistance, and it is in this respect that we have to recognise pig breeding problems from a new angle.

In attacking the problem from this new angle, one is entitled to know whether any guidance is available that will help us to achieve our object more easily. Our application to this question actually involves the possession of sound judgment as regards the type of animal, the keeping of records, and the ability to interpret them, and finally a sound knowledge of feeding and management that will reward our other endeavours with success.

So far as “type” is concerned we have to recognise a great many complications. The modern demand specifies a lean cutting pig, and as this runs counter to the idea of farmers for many generations past it is obvious that we are not going to get maximum efficiency along the new lines without a good deal of effort. Fortunately external conformation is some guide to the internal qualities of the pig, and there is little need for me to reiterate the importance of breeding pigs with light shoulders, good length of back and well-fleshed hams. Similarly as the head and feet are not particularly valuable in the finished product, fine quality in these respects is essential.

To-day these external conformational qualities for the purpose of selection of breeding stock can be still further strengthened by the actual behaviour of strains in respect of grading for bacon production judged by the examination of the carcasses. There is abundant evidence accumulating that one cannot depend entirely on external type, and that good judges are frequently disappointed in respect of grading results. I can cite as an illustration of this an experience in one of our English bacon factories. One of the largest breeders of Large Whites up to the end of the last year was securing an average of about 70% bonus pigs in his total consignment. At the beginning of the present year the average dropped to 40. Enquiry revealed that the reason was due to the use of two new boars whose progeny were beginning to

reach bacon weights. Breeding according to performance is, therefore, beginning to be appreciated, and it might be well to stress the point that results should take precedence over our own judgment so far as type is concerned.

It is hardly necessary for one to stress the other economic qualities that I regard as fundamental to successful pig-breeding, viz., the performance of the strains kept in respect of feeding capacity, fecundity and hardiness. These qualities are greatly affected by the degree of skill in management and feeding that is practised.

In our experience the system of feeding that is practised will undoubtedly affect the grading results in the finished pig. We have some evidence that a restricted diet towards the end of the feeding period achieves an improvement in grading. Personally I am not too happy about recommending unconditional restricted feeding. I feel that the ideal in pig feeding should be to keep a strain that will give good grading results without any complications so far as restricted diet is concerned. If grading results are to be seriously affected by this type of feeding, then it complicates the problem of selecting breeding stock that are required for fool-proof management.

On management I will offer one or two observations that might prove helpful. We have been troubled for some time on the Midland College farm with periodic outbreaks of coughing amongst our pigs. Various suggestions are put forward as to the cause of coughing amongst pigs. In our case it was accompanied by a tendency for the lungs to adhere to the ribs—and this was frequently commented upon by the factory to which our pigs were sent. Less than six weeks ago we appear to have tracked down the cause. Our system of feeding was to give our meal in a dry form and to give water after. I observed one day that these pigs at feeding time were tending to create a dust and that in their greed (being on restricted diet) they were bound to get a quantity of this dust and meal down on to their lungs. In order to check out the possibility of this being an explanation to coughing pigs, I obtained the co-operation of Dr. Berry, of Birmingham University, who made sections of the lung from an affected pig. The results indicated fairly clearly that irritation was being set up in the lung by the presence of foreign matter. Since reversing our order of feeding so that the meal is poured on the water in the feeding troughs there has been a marked reduction in the incidence of coughing. This experience would serve to show that dry-feeding is not without its troubles.

Our own particular system of management is to breed all our own feeding pigs. This I regard as an essential wherever maximum success is to be realised. In this way control is exercised on all the problems that have to be encountered. It may not always be possible to realise ideals, but if there is

one thing the pig-breeder has to fear—it is that of disease, and a clean herd that is more or less self-supporting, except for the essential changes of blood that are necessary, is likely to yield greater satisfaction. We have to recognise also that when a pure breeding policy is linked up with a progressive commercial policy one can expect with the more rigorous culling that is possible a higher standard of efficiency than when a pure-breeder is simply interested in the production of pedigree animals.

In pig-breeding to be really worth while, it is no use regarding it as a side-line in one's farming operation. It should be regarded as a major item, that is pursued with as great a regularity and attention as milk production, and it is equally deserving of the same high standard of labour that one now associates with modern milk-production. I still think the majority of agriculturists have yet to appreciate the full economic significance of the pig in agriculture, for apart from the returns that one anticipates, it is a producer of fertility in land that has few equals.

If pig-breeding is viewed in its proper light, it becomes a regular farming activity, with all the year round production and marketing. There are risks to be run in respect of the seasonal variations in climate, but this is a matter that can be readily overcome by making adjustments in the system of management and housing adopted. Most people who encounter serious losses do so from improper housing in winter, and the two points which deserve primary attention are warmth and adequate ventilations. Imperfect ventilation is one of the most serious deficiencies in many pig buildings, and it aggravates trouble—even anaemia in young pigs.

We are experimenting at the moment with a new product that is about to be placed on the market, viz., extract of grass, and we are anticipating some interesting work in the coming winter. We cannot express any opinion on its true value at the moment, except that as a source of Vitamins A and B and D it should be interesting as a substitute for cod-liver oil, while the other constituents might prove to be what the winter breeder and feeder of pigs has long been working for.

AGRICULTURAL TRAINING FOR BOYS AND GIRLS.

By Mr. J. GETTY, Chief Inspector.

(Reprint of Wireless Talk.)

There is a general impression among many people that the boy or girl who is not clever enough for anything else, should make his or her livelihood out of farming. In other words, anyone can be expected to succeed as a farmer, whether they've got brains or not. But if you only consider for a moment the essentials of successful farming you must agree with me that this idea is a complete mistake.

The farmer must not only understand his problems—he must be able to solve them himself. He has to supervise the details of his varied business, and how varied that business is, only those who have experience of farming conditions understand. The simple regularity of the machine shop, of the factory, is unknown and impossible on the farm. I know that those engaged in industry and commerce like to lecture the farmer on what they are pleased to call his “rule of thumb” methods. But let me say at once that it is only in the machine shop, at the desk, and possibly in the office, that these “rule of thumb” methods and precedent may prevail.

Life on a farm is much too variable to be hide-bound by tradition. The farmer is constantly faced with the care and development of complex living organisms and animals, and is dependent on ever changing weather conditions, so that he has to adapt himself to circumstances as they arise.

Those of you who know what farming means, will understand that the farmer has also got to think out and control labour and labour costs. He has got to deal with modern methods of crop production, and for this he must have a sound knowledge of the healthiest and most suitable crops required in present-day markets. Again, he has to consider his live stock programme and to produce the best type of animal fed in the most modern and economic way.

He must have a knowledge of diseases, too, in order to deal with those to which animals and crops are prone. And he must use his ingenuity to think out methods of prevention and simple remedies. In addition, having produced the best crops and animals, marketing methods have to be understood. So, from what I have said already, you will realise that farming, if it is to be successful, must be tackled not by the slow but by the best boy of the family. Where there is so much specialisation and competition you must use really modern methods if you're going to do well. In bygone days the normal method of training in agriculture was to serve—as is done in other businesses

—a long and early apprenticeship, and where time is no object I can think of no sounder way of gaining a knowledge of farming operations. But the day has gone when a man can afford to spend half his life-time learning the main principles of his business. The old saying, “What was good enough for me should be good enough for you, my boy”, has been superseded long ago.

Nowadays experience in farming can be increased and knowledge acquired in a much shorter time than formerly. And it is because of this that I want to describe briefly some of the facilities that are available to boys and girls in country districts to make them fit to take up farming as a career. There is a young generation coming on, and I feel that of the many different activities of the Ministry of Agriculture, the one that is the most important, without any exception, is that which deals with the training of boys and girls. For after all the boys and girls of to-day, will be the men and women of to-morrow, and anything we can do to help them when they are young will be amply repaid in the future.

Agricultural education in Northern Ireland is primarily directed by the Ministry of Agriculture in conjunction with the various County Committees of Agriculture.

Now let us examine for the moment the different forms of training boys and girls can make use of. Briefly they can be grouped under three headings:—

- (1) Itinerant Instruction, including classes in each County under County Committee Schemes.
- (2) Courses of training in schools.
- (3) University training for boys.

Each County Committee of Agriculture has appointed fully qualified Instructors in Agriculture, Horticulture, Poultry-keeping and Dairying. These officers visit the farms, lecture on subjects suitable to the district, and conduct classes in Agriculture, Horticulture, Poultry-keeping and Dairying, to young people at selected centres in each County. These day classes are arranged at local centres where there is a demand for them, and are held in the afternoon to suit the convenience of the pupils. By this means instruction is brought to the homes of the people, especially to those who cannot afford time to take special courses at recognised schools.

Agricultural classes are held every year in the winter-time at different rural centres throughout Ulster. They take place twice a week for 15 or 16 weeks, and at them boys are taught the most up-to-date methods of manuring and growing crops, and the management and breeding of live stock.

They are also given instruction in the examination and identification of seeds and grasses, the prevention and treatment of disease in stock and

crops, and demonstrations on the growing of fruit and vegetables. These classes commence about the beginning of next month, and if you wish to be enrolled you should get in touch with your agricultural instructor.

Now for the girls—The poultry instructors give short courses of lectures on such subjects as Poultry-keeping and Dairying. Here girls are taught the management, breeding, feeding and housing of poultry, and the care and treatment of milk. In addition they are shown the latest ways of handling dairy produce.

The teacher has all the necessary appliances at these classes to illustrate what she has said by practical application and demonstration. All girls from 15 years of age and upwards can attend, and the whole of the instruction at these County classes is provided free of charge.

Next we come to the schools—At Greenmount Agricultural and Horticultural College there is a ten months course for boys over 16, and there is room for about 48 students. The course of instruction enables farmers' sons, or those boys who wish to become farmers, to gain a knowledge of the technical as well as the practical side of agriculture, which will stand them in good stead when they start working on their own or their father's farms.

All Agricultural subjects are dealt with, together with Horticulture, Woodwork and Veterinary Science.

A number of scholarships value £65 per annum are provided by the County Committees of Agriculture for training at Greenmount. You can get particulars of these from the County Instructors or Secretaries of County Committees of Agriculture, and also from the Ministry.

Such a course as the one at Greenmount, although primarily intended for boys who are going back to their farms, is an excellent preliminary training for students who want to take up advanced work in connection with the Agricultural faculty at the Queen's University, Belfast.

So much for boys at the moment, as I want to say a few words about the training schools for girls. At the North-West School, Strabane, there are courses of about 11 weeks, for girls who can be spared from home for at least a term, and who want more detailed instruction than they receive at the County classes. Such courses include Poultry-keeping, Buttermaking, Rural Housewifery and Home Nursing. There is accommodation altogether for 24 pupils. Here again teaching is very practical, and is arranged so that it can be usefully applied in the homes of the pupils. Every County Committee of Agriculture in Northern Ireland provides scholarships to this school. These scholarships cover cost of tuition, board and residence. There is no qualifying examination, but girls must be 17 before they can get a scholarship.

For more advanced instruction there is the Ulster Dairy School, which caters for some 50 girls. This school is chiefly a centre to train girls who wish to go back to their homes, but it also looks after the interests of girls who intend to try for posts as dairy maids in creameries, or assistants on Poultry farms. In addition to all this the school is used as a training centre for teachers in Poultry-keeping and Dairy Work. Of course only a limited number of the most capable pupils are selected for teachers. Most of the girls either return to their homes after completing three terms, which is the certificate course, or obtain posts on poultry farms or in home dairies or creameries.

All those who go to the Ulster Dairy School must take the combined course of Poultry-keeping and Dairying, and Rural Housewifery for the first three terms, which, as I have said, is the length of the certificate course. Each term lasts about 11 weeks. Those who want to specialise in Poultry-keeping, Dairying or Housewifery, however, remain an extra term.

And finally, the girls who are chosen for training as teachers must do the complete course at the school, which takes up seven terms, or about 21 months. At the end of this time, prospective teachers have to spend twelve months on an approved Commercial Poultry Farm in order to gain further practical experience before being finally qualified.

The fees charged at the Ulster Dairy School are three guineas a term for the first three terms, and six guineas a term for the fourth and subsequent terms.

The courses at both schools are designed to give a sound training in modern economical and labour-saving methods on all matters relating to women's activities on the farm.

The efficient and careful management of the home, the dairy and the poultry is a most important matter to-day, and one which contributes in a very large measure to the happiness and prosperity of family life. It is for this reason that I urge as many girls as possible to take advantage of these facilities for training that I have just been talking about. Copies of the prospectus of these schools, and particulars of the courses, can be obtained from the Secretary, the Ministry of Agriculture, Stormont, Belfast.

The next term at both these schools begins on the 13th October, and if you wish to take advantage of the school training you should apply at once to have your name put on the admission list, as pupils are accepted in the order in which applications are received.

I have often heard people say that Agricultural Education or specialised training tends to take boys and girls away from the farm, rather than to give them more interest in country life. Do not for a moment believe such statements. They are very seriously disputed by the fact that of the boys passing

through Greenmount 82 returned to their farms, and of the others the majority got some kind of agricultural posts.

And of the girls trained at the Ulster Dairy School 87% returned to their homes or obtained positions on farms, while several of the others took up domestic work.

Amongst the best and most progressive farmers and farmers' wives in Northern Ireland to-day are those who have attended courses of training in past years, and they invariably give credit for their success to the instruction received at classes and schools.

The records show that in many instances the boys and girls who are now enrolled at classes are the sons and daughters of those who attended classes themselves many years ago.

Surely no better testimony of the value of the instruction can be given, or any further evidence necessary to indicate that Agricultural training is not only beneficial, but encourages boys and girls to take more interest in their farm and home.

Finally, I want to refer to the University training at Queen's University in the faculty of Agriculture. There are two courses provided for students. One is a general course in agriculture specially suited to those who want to be farmers or who are going to become agricultural instructors and teachers. The other is more specialised for students who are keen to take up research work and to obtain their degree in Science, in addition to specialising in some of the agricultural subjects. For posts such as Agricultural Instructor or research worker a university degree is now essential.

A limited number of scholarships value £95 per year for 4 years, are provided by the Ministry of Agriculture for these special courses of training in Agriculture. This makes it possible for the selected students to pursue their studies practically free of cost.

In addition to the training in Agriculture proper there are courses in allied subjects, such as Horticulture and creamery management, and a limited number of scholarships are provided so that the boy who wishes to specialise in these subjects can do so unhindered by financial consideration.

This, complete as it may be, is not the full story. In order to keep teachers and farmers supplied with the most up-to-date information, the Ministry immediately after its formation, established a number of Research Stations dealing with Veterinary work, Plant Breeding and Disease, Animal Nutrition, Animal and Plant Husbandry, Milk and Poultry.

At these centres a number of qualified officers are continually at work trying to solve problems that worry the farmer. When a solution has been found

the information is passed on direct to the farmer concerned, and made known to the farming community through the educational channels mentioned to-night.

It will thus be seen that the very latest information is made available to anyone who wishes to learn about any subject connected with agriculture.

One other form of training that I have not so far mentioned is the Young Farmers' Club movement which is carried out by the Farmers' Union. A large number of clubs are located all over Northern Ireland. Membership is open to both boys and girls.

These clubs encourage young people to come and discuss social and other topics of country life. The movement is of great educational value and tends to give a broader outlook on life generally.

Are you a member of a club? If not, you should be.

And now what of the future—with increasing competition more specialisation is necessary. Farm produce must be placed on the market in the way that appeals to the consumer. This means improved methods, both in production and marketing, so you will see how vital it is for you to be efficiently trained and equipped to make a success of your calling.

To sum up, you have instructors at your door to help you. You have classes to attend without going away from home. You have schools for those who can afford to spend six or twelve months at them; and finally, the four-year course in the University for degree students. It is up to you to take advantage of these chances.

MARKETING SCHEMES.

AGRICULTURAL MARKETING (PIG INDUSTRY) ACT (N.I.), 1934 :—

PIG PRICES FOR OCTOBER, 1936.

The Pig Industry Council for Northern Ireland have announced the following prices for dead pigs sold by producers to curers in Northern Ireland in October, 1936. These prices are above those of last month.

Weight Class. (Dead Weight)	Grade A.	Grade B	Grade C.	U.L. or U.F.
I c.1.1.14 to c.1.2.14	61/11	58/11	55/11	52/11
II c.1.2.15 to c.1.3.14	61/11	58/11	55/11	52/11
III c.1.3.15 to c.2.0.0	58/11	55/11	52/11	49/11
IV c.2.0.1 to c.2.0.14	52/11	49/11	46/11	43/11

U.L.—Under Grade A measurements.

U.F.—Over Grade C measurements.

The price for partly black pigs between c.1.1.14 and c.2.0.14 is 5/- per cwt. below the relevant grade price.

Authorised cuts :—

- (a) Broken ham (dry, shank and/or shell bone break)—5% of the gross value of the carcase.
- (b) Broken ham (wet break)—12½% of the gross value of the carcase.
- (c) Shoulder-stuck carcase—3/- per shoulder affected.

The gross value of a carcase is the product of the dead weight and the relevant grade or other price per cwt.

Where portion of a pig carcase weighing between c.1.1.14 and c.2.0.14 is condemned and the existence of disease could not reasonably have been known to the producer at the time of slaughter the appropriate grade price shall apply. If the carcase is wholly condemned on account of disease, the existence of which could not reasonably have been known to the producer at the time of slaughter, the relevant Grade B price shall apply.

The foregoing prices do not apply in the case of (a) wholly black pigs, boars, rigs or stags, sucked sows, and pig carcasses weighing under c.1.1.14 or over c.2.0.14, and (b) pigs visibly diagnosable as diseased before slaughter and subsequently condemned; emaciated or screw pigs; smelling pig carcasses with definite indications of putrefaction and pig carcasses badly abused or damaged before being handed over by the producer to the curer.

PRICES FOR WILTSHIRE PIGS SOLD ON DIRECT CONTRACT.

In the case of pigs sold alive under direct contract to Wiltshire curers the prices per dead cwt. payable for graded pigs delivered in respect of the month of October, are as follows:—

Weight Class (Dead Weight)	Grade I.	Grade 2.	Grade 3.
Under c.1.0.14	55/11	55/11	55/11
c.1.0.14 to c.1.2.7	67/11	63/11	59/11
c.1.2.8 to c.1.2.10	64/11	60/11	56/11
c.1.2.11 to c.1.2.14	62/11	58/11	54/11
Over c.1.2.14	59/11	55/11	51/11

(The standard price, exclusive of bonus, for bacon pigs sold by contract in Great Britain during October is 12/- per score dead weight, equivalent to 67/2 per cwt.).

PRICES FOR LIVE PIGS SOLD TO THE PIGS MARKETING BOARD.

The following prices per live cwt. will be paid for live pigs by the Pigs Marketing Board on and from October 1, 1936, until further notice:—

Weight Class (Live Weight)	Grade 1	Grade II.	Grade III.	Unsuitable.
c.1.2.0 to c.1.3.14	51/6	49/-	46/6	40/-
c.1.3.15 to c.2.0.0	47/6	45/-	—	40/-
c.2.0.1 to c.2.1.14	45/-	42/6	—	40/-
c.2.1.15 to c.2.2.7	42/6	40/-	—	37/-
c.2.2.8 to c.2.2.21	39/-	36/6	—	33/-

These prices do not apply to live pigs outside the above weights, live pigs intended for breeding, live boars, live sucked sows, rigs or stags, injured or diseased pigs, live in-pig gilts, or live pigs sold (on contract registered with the Pig Industry Council) to curers in Northern Ireland. All other live pigs inside these weights can be sold only to the Board.

AUTHORISED DEDUCTIONS.

Every pig (dead or alive) sold to a curer or to the Pigs Marketing Board is subject to a contribution at present amounting to 1/-.

In addition to this amount, a deduction not exceeding 6d. per pig may be made in the case of sales to curers to cover insurance, so that the producer will not suffer financial loss if the carcase is condemned as unfit for human consumption.

In the case of pigs sold to the Board, there is a deduction of 2/6 per pig for marketing charges.

COST OF STANDARD PIG RATION.

The average retail cash price per cwt. of the standard ration, as calculated by the Ministry for the sixteen weeks period ended 19th September, was 7/8 $\frac{3}{4}$. This price was used, together with the realised prices of bacon and hams and of fresh meats over a set period, to determine the standard price of pigs for October.

The ration upon which the feeding cost is based is as follows:—

Barley Meal	...	...	...	30%
Maize Meal	...	...	...	40%
Pollards (White)	...	...	...	20%
Extracted Soya Bean Meal	...	...	...	5%
Meat and Bone Meal (60% Protein)	...	...	...	5%

GRADING STATISTICS.

Table showing the percentages of pig carcasses falling within the weight and grade classes indicated, during August, 1936.

Grade A.				Grade B.				Grade C.				Total
1	2	3	4	1	2	3	4	1	2	3	4	
19.83	13.34	1.67	.29	14.67	16.56	2.80	.63	5.63	9.06	.98	.24	85.70

UNGRADED CARCASSES.

Under Grade A measurements. U.L.	Over Grade C measurements. U.F.	Wholly condemned. U1.	Wholly black, injured or damaged. U2.	Overweights, Underweights, boars, sows, etc. X.	Partly Black. Y.	
.02	3.70	.06	.67	9.82	.03	14.30
Total						100%

The above figures have been calculated from the purchase and grading statements which the curers furnish to the Ministry.

There was a further decline in the volume of trade during August. The average price per carcase was 11d. below the July figure at £4 9s. 7d., and the average price per cwt. 6d. cheaper at £2 15s. 4d. The average weight of each carcase remained unchanged at c.1.2.13.

The following table gives the result of an analysis of the purchase and grading statements furnished by Wiltshire bacon curers in respect of live pigs delivered on direct contract by producers during the month of August, 1936.

Weight Class.	Grade 1.	Grade 2.	Grade 3.	Unsuitable.	Total.
Under c.1.0.14	.16	.59	.08	—	.83
c.1.0.14 to c.1.2.7	32.95	44.70	16.42	.16	94.23
c.1.2.8 to c.1.2.10	.24	.99	.75	—	1.98
c.1.2.11 to c.1.2.14	.13	.67	.48	—	1.28
Over c.1.2.14	.08	.75	.85	—	1.68
Total	33.56	47.70	18.58	.16	100

The average price per cwt. in respect of these deliveries works out at £3 0s. 8d.

The average weight works out at c.1.1.16., the net average price per pig being £4 4s. 6d.

THE CATTLE INDUSTRY (EMERGENCY PROVISIONS) ACTS, 1934 AND 1935.

The total amount paid to Northern Ireland owners in respect of subsidy, up to and including 3rd October, 1936, was £530,705 3s. 9d., and was in respect of 254,180 animals. The average amount received per head of cattle to that date was, therefore, £2 1s. 9d. The return for the week ended 3rd October shows that payments were made to Northern Ireland owners for 2,390 head of cattle, including 1,708 steers, 613 heifers, and 69 cow-heifers. The total realized price of these animals was £30,923 7s., and the average price per head £12 19s. and per cwt. live weight 31s. 2d. The total weight of cattle amounted to 19,847 cwt., and the average weight of each beast 8 cwt. 1 qr. 6 lb. The average amount of subsidy received per head was £2 1s. 6d.

WHEAT ACT, 1932.

THE WHEAT COMMISSION MAKE A FINAL PAYMENT TO WHEAT GROWERS FOR 1935-36.

The Wheat Commission despatched cheques last month to 92,626 registered growers in respect of the final instalment of deficiency payments for the cereal year ended 31st July, 1936. The aggregate amount involved in this final payment is approximately £1,193,000.

In addition, 1,098 payments, aggregating £36,000 will be made as soon as possible in those cases where, by reason of the death or bankruptcy of a registered grower, or for some other reason, the Commission have had to investigate the title of persons claiming the deficiency payments. When these payments have been made, the Commission will have disbursed approximately £1,229,000 as the final payment for the cereal year 1935-36.

The final payment and the four advance payments made in December, 1935, and February, April and July, 1936, respectively, amount altogether to a total payment of approximately **£5,644,000 for 1935-36**. Averaged over all registered growers who have received deficiency payments, this sum would provide just over **£60 per grower**.

Approximately **£33,650,000 cwt.** of millable wheat have been credited to date in the books of the Commission to the **93,724** growers who have qualified for deficiency payments, and 209,511 wheat certificates relating to the sales of this wheat have been delivered to the Commission.

The deficiency payment for 1935-36 is equivalent to **3s. 4.26d.** per cwt. (approximately 15s. 1d. per quarter) in respect of all sales of wheat credited to growers for that year from wheat certificates delivered to the Commission.

Where growers have already received an advance payment of 2s. 9d. per cwt. on account of any wheat, the final payment with regard to that wheat will, of course, be the balance of **7.26d.** per cwt. only.

THE MARKETING OF EGGS ACT (NORTHERN IRELAND), 1936.

The Egg Marketing Committee for Northern Ireland, established under the provisions of Section Three of the above Act is composed as follow :—

APPOINTED BY THE MINISTER OF AGRICULTURE.

Sir Roland T. Nugent, D.L. (Chairman), Portaferry House, County Down.
W. Magowan, Esq., 106 Hill Street, Newry.
W. Maddin Scott, Esq., Millbank, Omagh, Co. Tyrone.

REPRESENTATIVES OF PRODUCERS.

John Gibson, Esq., Bay View, Greyabbey, Co. Down.	} Appointed by the Ulster Farmers' Union.
W. J. Hyndman, Esq., Gortinure, Newbuildings, Londonderry	
Chas. B. Smith, Esq., Craigoran, Islandmagee, Co. Antrim.	
T. J. Cuddy, Esq., Cabragh, Dungannon, Co. Tyrone	} Appointed by the Ulster Agricultural Organisation Society.
John Warnock, Esq., M.A., Rathgael, Bangor, Co. Down	
	} Appointed by the Northern Ireland Utility Poultry Society.

REPRESENTATIVES OF LICENSED WHOLESALE DEALERS.

Robert Bell, Esq., 2 Wellington Place, Belfast.	} Elected by Licensed Wholesale Dealers of Class A.
A. E. Gale, Esq., c/o Messrs. A. E. Gale & R. Gale, Brookeborough, Co. Fermanagh.	
Wm. MacAdam, Esq., c/o Scottish Co-operative Wholesale Agricultural Society, Enniskillen.	
Jas. Pepper, Esq., c/o Messrs. J. Harvey & Co., Kenlis Street, Banbridge, Co. Down.	
H. Roberts, Esq., c/o Messrs. Thos. Robinson, Sons & Co. Ltd. Canal Basin, Strabane, Co. Tyrone.	
Wm. Allen, Esq., New Villas, Union Street, Lurgan.	} Elected by Licensed Wholesale Dealers of Class B.
David McComb, Esq., 231a, Castlereagh Road, Belfast.	

THE LICENSING OF RETAILERS OF EGGS.

WHO WILL REQUIRE LICENCES?

The Marketing of Eggs Act (Northern Ireland), 1936, provides that on and after a date to be fixed by the Ministry of Agriculture—probably the 1st November, 1936—it will be an offence for any person to sell eggs by retail unless he is the holder of a retailer's licence. The only sales which are exempted are sales of eggs by a poultry-keeper where the eggs have been produced by his own hens or ducks. A poultry-keeper, however, who purchases extra eggs for re-sale by retail must have a licence in order to enable him to sell the eggs which he has purchased. Similarly, the holder of a Class A licence or a Class B licence under the Marketing of Eggs Acts, must, if he sells eggs by retail, obtain a retailer's licence in addition to his Class A or Class B licence.

HOW TO OBTAIN A RETAILER'S LICENCE.

Applications for retailers' licences should be made to the Ministry of Agriculture, Stormont, Belfast, without delay. Application forms may be obtained at local police barracks, from Class A licence holders, or directly from the Ministry of Agriculture.

AGRICULTURAL NOTES.

SEASONAL FARM NOTES.

OATS.—Huts of oats should not be allowed to remain in fields for prolonged periods if the crop is in a fit condition for stacking. This practice may not only result in the crop being further damaged should wet weather ensue, but where the huts have been built on land sown out to pasture, the young “seeds” underneath the huts may also be irreparably damaged.

THATCHING OF STACKS OF GRAIN.—Stacks of oats and of other grain crops should be thatched as soon as possible after being built to prevent unnecessary waste. The stacks should be allowed to dry on the outsides before thatching is done.

POTATOES.—The lifting and storing of main-crop potatoes will claim attention after grain crops have been saved. Owing to the wet weather this season there is likely to be an increase in the proportion of diseased tubers. It is, therefore, of great importance that the crop be sorted at lifting time, and the saleable tubers separated from the chats and diseased potatoes, so that the spread of disease and undue loss may be prevented.

STORING IN PITS.—Potatoes which are stored in pits should be well thatched with straw before earthing-up is done so as to ensure that they will turn out in a clean, dry condition when required. Ventilation should also be provided for a time after pitting by leaving a space of from eight to ten inches at the apex of the pit, and placing an extra layer of straw over this space for a week or two. By this time all danger of heating will have passed, when the extra straw can be removed and the earthing-up of the pit completed.

STORING IN HOUSES.—Potatoes which are stored in houses should not be piled too deeply, as, if this is done, heating and rotting may occur and loss result. It is a good plan to leave the doors of houses in which potatoes are stored open during the day-time, so that air may circulate freely throughout the house and provide efficient ventilation.

CLEANING OF POTATO GROUND.—Ground from which potatoes have been dug should be well harrowed, and any tubers remaining in the ground lifted and either stored separately or used for feeding purposes.

MANGELS.—The lifting and storing of mangels should be completed as soon as possible now before frosts occur. The clamp should be made safe against damage by frost by covering it with a thick layer of rushes, ditch cuttings or old grass.

WINTER WHEAT.—Winter wheat should be sown as soon as the ground is in a fit state and before severe weather conditions set in. Varieties such as Queen Wilhelmina and Squarehead's Master have given good results in Northern Ireland, and are suitable for a variety of soils. The seed should be sown at the rate of from 14 to 16 stones per statute acre, and it is an advantage to dress the seed before sowing with "Ceresan" or "Agrosan G" at the rate of from 5 to 8 ounces per cwt. of seed as a preventive of smut and other seed-borne diseases.

MANURING OF GRASSLAND.—The application of a phosphatic manure to grassland in poor condition is a sound practice but, if results are to be obtained in next season's grazing, the manure should be applied as soon as possible. Suitable phosphatic manures for this purpose are high grade basic slag, Semsol and Gafsa rock phosphate. Any one of these may be applied at the rate of from 4 to 6 cwt. per statute acre. On the lighter classes of soils the addition of 1 cwt. 30 per cent. potash salts per acre gives beneficial results. Where there is a mat of old grass or fog the pasture should receive a thorough harrowing before the manures are applied, otherwise the best results from manuring will not be obtained. Disc harrows and freshly-sharpened, straight-tined zig-zag harrows may be employed for this purpose with very satisfactory results. The harrowing must, however, be done thoroughly so that the turf is cut up in lengthwise and crosswise directions. The application of a phosphatic manure not only increases the quantity of herbage produced, but also promotes the growth of good grasses and clovers, so that the stock-carrying capacity of the pasture is increased. Moreover, as there is likely to be a scarcity of good-quality hay this winter, and as the prices of feeding stuffs have increased, money spent on the improvement of pasture now will be well repaid by the production of better grass early next spring. It will be observed from page 62 of this report that prices of phosphatic fertilisers are again very reasonable this season, and where pasture is in poor condition farmers are strongly advised to manure a portion, if not all, of their grassland.

This dressing of manure is also suitable for applying to young "seeds" and is beneficial alike where grass-seed is to be saved or where hay is to be saved in the ordinary way.

RATS.—At this time of year rats take up their winter quarters in farm buildings and in stackyards. These pests are responsible for considerable damage and loss each year, and a determined effort should be made to exterminate them. Of the various methods employed for the destruction of rats, the use of poisoned baits is the most convenient. Various proprietary poisons can be obtained, and many of these give very satisfactory results. A cheap and efficient poison bait can be made up by mixing together equal

parts of Barium Carbonate and dripping. If desired, a more attractive bait can be made up with Barium Carbonate as the poisonous principle, using the following formula :—

6 ounces	Barium Carbonate.
4 ,,	Dripping.
1½ ,,	Salt.
16 ,,	Oatmeal or Fishmeal.

The dripping should be melted in a tin, the requisite amounts of the other ingredients added, the contents well stirred and the mixture allowed to set. A flat piece of stick should be used for transferring the bait from the tin to the rats' burrows, care being taken that the mixture is not touched by hand. The baits should be dropped, in pieces the size of a hazel nut, in the rats' burrows, all burrows being treated at the same time. Barium Carbonate can be obtained from any chemist.

When using poisoned baits, the greatest care should be exercised, particularly on farms, so that poultry and livestock cannot gain access to them. Baits should be laid down at night, and any which have not been taken by the rats should be removed the following morning.

SEASONAL LIVESTOCK NOTES.

WINTER RATIONS.—The making up of suitable and economical rations for the winter feeding of farm stock calls for consideration at this time. The increase in the prices of feeding stuffs necessitates careful judgment in the purchase of foods so that those which offer best value for money may be obtained. Moreover, supplies of home-grown fodder are not likely to be of good quality on many farms owing to unfavourable weather conditions at harvesting so that a greater proportion than usual of rations for stock will require to be made up from purchased foods this winter.

The purchase of proprietary cakes and meals is still a common practice on many farms. Many of these foods, although satisfactory, cost considerably more than meal mixtures of a similar nature which are made up on the farm, and their use increases feeding costs considerably.

When the rations are made up on the farm it is generally found necessary to purchase foods rich in protein so that properly balanced mixtures may be fed. A ready means of ascertaining which food supplies protein at the cheapest rate is to divide the percentage of protein in the food into the price per ton at which it is offered. This gives the cost of the unit of protein in the food. A comparison of the prices of protein in the different foods, as determined from the average prices of these foods, is given in a table on page 64 of this report.

It will be observed that of the protein-rich foods, decorticated earthnut cake supplies protein at the cheapest rate. This food can be used in rations for dairy cows and other cattle with satisfactory results. Examples of suitable meal mixtures incorporating decorticated earthnut cake for cattle feeding purposes, along with economical rations at present prices of feeding stuffs for other stock are given on pages 52 and 53 of this report.

SHEEP.—To obtain good breeding results, rams should be kept in a fit condition by feeding an allowance of concentrates. For this purpose a mixture of equal parts oats, kibbled maize and linseed cake, is suitable. The breeding flock should also be changed periodically to different fields so that the animals may be maintained in a forward, thriving condition.

FOOTROT.—A watch should be kept for footrot at this time so that any sheep showing signs of lameness may be examined and treated, if necessary, in good time. If the trouble is neglected and suppuration allowed to set in the difficulty of effecting a cure is increased. A simple and effective dressing for footrot is a solution of 1 lb. copper sulphate ("bluestone") in 1 gallon water, which should be applied after the horn part of the hoof has been well pared with a sharp knife. In severe cases it is advisable to trim the foot thoroughly and then to apply a dressing consisting of 1 oz. powdered copper sulphate, 1 oz. turpentine, and $\frac{1}{2}$ lb. of lard, after which the foot should be bandaged. Further particulars regarding the treatment of footrot are given in Leaflet No. 63.

LIVER FLUKE DISEASE.—As wet seasons are favourable to outbreaks of fluke in sheep, precautionary measures should be taken early this year. The animals should be grazed on dry, well-drained fields and kept off those which have marshy areas on which surface water lies. The use of carbon tetrachloride for the control of fluke is now common, and the drug is safe and efficacious, provided certain conditions are fulfilled. The correct dose is one cubic centimetre for each sheep. As bad results may follow the use of too large or too small a dose, only capsules guaranteed to contain the correct amount should be purchased. A guarantee of purity should also be obtained. In the case of sheep receiving hand feeding, this should be discontinued for at least four days prior to the administration of carbon tetrachloride, and grass alone allowed during this period. Leaflet No. 24 gives further particulars regarding the control of this disease.

"HUSK" OR "HOOSE" IN CATTLE.—Outbreaks of this trouble have been prevalent this season. The most satisfactory method of preventing attacks is to house the cattle at night and not to allow them out until the dew is off the grass in the morning. The cattle should also be maintained in good con-

dition by liberal feeding. A change of pasture should also be given, if at all possible, so that reinfestations of the parasites which cause the malady are prevented. Further hints on the prevention and treatment of this trouble are given in Leaflet No. 80.

Pigs.—The advantages of utilising potatoes in pig rations may again be emphasised. Potatoes are low in price and their inclusion in the ration will reduce feeding costs considerably. Moreover, at this season of the year there will be quantities of “chats” and refuse potatoes on farms where the correct practice of sorting the potatoes at the time of digging is carried out, and the most profitable method of disposing of these is to feed them to pigs. For pig feeding purposes potatoes should be boiled, and, provided they are used in the correct proportions along with a suitable meal mixture, satisfactory results will be obtained. Examples of suitable meal mixtures for use along with potatoes are given on page 53 of this report, and also in Leaflet No. 35.

The value of separated milk and of buttermilk for pig feeding purposes may also be stressed. The use of milk reduces the cost of fattening by making it unnecessary to include expensive protein-rich foods in the meal mixture, and, further, as milk is rich in mineral matter, its use also obviates the necessity to feed additional mineral supplements. The allowance of separated milk or of buttermilk should be not less than one quart per pig daily, except during the last few weeks before marketing, when the allowance may be reduced by half. During the early stages of fattening, and particularly if potatoes form part of the ration, the allowance of milk should be at least three pints per pig daily. Separated milk is a very valuable food also for young pigs and, if available, an allowance should be given for some time following the weaning stage, as it is at this stage that a setback is most likely to occur.

SEASONAL GARDEN AND ORCHARD NOTES.

LIFTING AND STORING OF CARROTS AND BEET.—Carrots and beet should be lifted now. Care is necessary in lifting the latter to ensure that the roots are not damaged in any way; the leaves should be removed by twisting instead of by cutting them off. Both carrots and beet should be stored between layers of sand or fairly dry soil, in a cool and moderately dry place, where they will not be exposed to the winter rains.

PARSNIPS.—Parsnips may also be lifted now and stored in the same way as carrots and beet, but, generally, they keep best if left in the ground, and lifted as required. When periods of severe weather are expected a quantity sufficient for a fortnight's supply or so may be lifted before the ground gets frozen too hard, and stored temporarily as for carrots and beet.

POTATOES.—The digging and storing of main crop potatoes should be completed as soon as possible. If the crop is being stored in a house care should be taken to see that the house is frost proof, yet well ventilated. The seed for next year should be selected at digging time, and placed in sprouting boxes. Care should be exercised to see that the house is kept free from aphides (green fly), as if these insects gain access to the young sprouts they are liable to infect the seed with virus diseases such as leaf-roll, and thus a diseased crop will be produced. No other plants should be stored in the sprouting house, and it should be fumigated periodically with nicotine or other fumigant to keep insect pests in check.

DIGGING AND TRENCHING.—As the vegetable ground in the garden becomes vacant it should be dug or trenched and manured as required. Fallen leaves, decayed annual weeds and other soft (not woody) rubbish should be spread on the surface and incorporated with the soil as it is being dug or trenched. If trenching is carried out, care should be taken not to bring the lower soil to the surface unless it has been well mellowed by exposure to air, etc., during previous seasons.

CELERY.—If not already completed, the final earthing should be done on a dry day, taking care to make the soil firm around the neck of each "head" with the hands, and leaving the surface soil in such a way that the rain will be diverted from the centres of the plants.

APPLES.—The picking and storing of apples and pears should be completed as soon as possible. Only sound fruit should be stored. Windfalls and badly blemished fruit should not be brought into the store, but should be disposed of without delay.

As the market for Bramley's Seedling apples will probably be overloaded until after Christmas, growers who have a good supply of large clean fruit of this variety should consider the advisability of sending a quantity of it to a cool gas store where the fruit will keep with little, if any, deterioration until the end of April next. Fruit, if properly packed and handled by the grower and stored in this way, will be much more likely to give a profitable return than similar fruit stored in the ordinary farm building.

PLANTING OF FRUIT TREES.—Supplies of fruit trees and bushes should be ordered from nurserymen as soon as possible. By ordering early there is a greater likelihood of obtaining satisfactory plants than if the order is placed when the planting season has advanced. Planting can be carried out from now onwards whenever the soil is reasonably dry. Notes on planting and a list of varieties of the different fruits recommended are given in Leaflet No. 15.

PRUNING.—Pruning of black-currants, raspberries and loganberries should be completed as soon as possible. In pruning the black-currant, as much as possible of the old wood should be removed, consistent with the shape of the bush and the spacing of the shoots. Preference should be given to young shoots coming from below ground level as it is on these that the largest and best berries are borne. All the cuts should be made as closely as possible to the shoots that are being retained, as short stubs generally die back and often harbour injurious insect pests. The prunings should be gathered and burned.

Raspberries and loganberries should have all the wood which bore fruit last year removed as near to the surface of the soil as possible, and the young canes of this year's growth thinned, where necessary, leaving the strongest canes to produce fruit next year. The loganberry canes should be tied into their fruiting positions, and, if the raspberries are to be tied, this work should also be carried out now while the weather is mild.

HALF HARDY PLANTS.—Where these have been grown out of doors during the summer, they should be lifted before severe frost sets in. Plants which have bulbous roots, such as dahlias, tuberous-rooted begonias, etc., should be stored in a frost-proof building, while species such as geraniums, lobelias, etc., should be placed in boxes or pots and grown on under glass for the winter. Spring flowering plants such as tulips, hyacinths, daffodils, wall-flowers, forget-me-nots, etc., should be placed in their flowering positions as rapidly as possible. Chrysanthemums, grown in pots or in beds during the summer for flowering under glass during the autumn, should be brought under cover at an early date. When brought in these plants should be given the maximum ventilation possible when grown in pots, and the atmosphere kept dry to prevent the blooms from being damaged by damp. Where the plants have not been grown in pots, they should, when moved to the glass structures, be kept close and moist for a few days until they become established again, after which the ventilation should be liberal as for pot plants.

GLASSHOUSES.—These should be thoroughly washed down as they become vacant, using a good disinfectant such as emulsified crude cresylic acid for this purpose. The ventilators should be kept open while this work is being carried out, and then closed for at least 48 hours, after which the houses should be well ventilated before any green plants are brought into them again.

BEES.—As Acarine disease appears to be very prevalent this autumn, it behoves every owner of bees to apply Frow's Treatment to all his stocks during the early part of this winter as a preventive measure. This treatment entails the introduction of the following mixture to the hive:—Nitrobenzine,

2 parts by volume; Safrol, 1 part by volume; Petrol, 2 parts by volume. The **mixture** should be applied on alternate days until six applications have been made; about 20 minims of the mixture is sufficient for each treatment for a standard 10-bar frame hive. Further particulars of the life history of the causative organism of Acarine disease and the method of treatment are given in Leaflet No. 76—"Acarine (Isle of Wight) Disease of Bees".

SEASONAL POULTRY-KEEPING NOTES.

WINTER EGG PRODUCTION.—Profits from poultry-keeping depend largely on the egg production obtained from now onwards during the winter months when prices are highest. Every effort should, therefore, be made to encourage production now in the laying flock.

✓ Liberal feeding and comfortable housing are essential if a high level of egg production is to be obtained during the winter. As the days shorten, the time available for feeding is lessened, and the conditions of management and the system of feeding should be such as shall encourage the birds to consume sufficient food for their requirements. A hopper of dry mash should be before the birds at all times and, in addition, a daily feed of mash, wet with separated milk, should be given. A feed of grain, consisting of 2 parts cracked maize, 1 part oats and 1 part wheat, or of cracked maize only, should also be supplied before the birds go to roost.

BALANCE BETWEEN MASH AND GRAIN.—The proportion of mash to grain fed to laying hens has an important influence on the results obtained. If an excessive quantity of grain is fed, the birds will not have sufficient appetite to consume enough mash. Accordingly, they will not receive enough protein matter for egg production, will become overfat, and will slow down in production. On the other hand, an insufficient supply of grain may cause the birds to lose flesh and so become incapable of maintaining production. The condition of the birds is the only reliable guide in this connection. If on handling some of the birds, they are found to be rather thin and apparently losing weight, they should be encouraged to eat more grain, while if they appear to be overfat the quantity of grain should be reduced so as to encourage the consumption of mash and thus increase the proportion of protein food eaten.

FORCING FOODS.—The feeding of excessive amounts of protein-rich foods such as fish meal, meat and bone meal and soya bean meal, in a effort to promote egg production should, however, be avoided. Undue forcing of the birds may undermine their stamina and health, and may result in a high mortality. Encouragement of egg production without loss of body weight in the birds should be aimed at. Full particulars regarding the feeding of laying hens are given in Leaflet No. 3.

HOUSING.—The housing of layers is also an important consideration in obtaining good production. The house should be well lighted, well ventilated but free from draughts, and capable of providing ample accommodation for the flock during cold, wet days, when it is advisable to keep the birds indoors. Overcrowding in draughty houses is a predisposing cause of outbreaks of colds and other ailments in the flock which seriously interfere with production.

The application of limewash, to which a small quantity of paraffin oil has been added, periodically to the interior of the house will be found to have a beneficial effect on the general health of the birds, in addition to brightening up the house. The litter should be changed frequently so that the birds are encouraged to scratch through it freely; it should never be allowed to remain in the house when it has become soiled and damp.

BREEDING STOCK.—The management and feeding of the birds selected for breeding require careful attention from now onwards. The birds should be given every opportunity of building up reserves of bodily vigour and, to this end, free range on fresh pasture is essential.

If portable houses are available, they should be used for the breeding stock. Such houses can be moved readily to a fresh portion of the field and thus the birds can enjoy the benefits of absolute free range, which is not possible with a fixed house even though it gives access to a large field over which the birds can range. About 2 square feet of floor space per bird should be allowed in portable houses.

As there is evidence to suggest that poor hatching, with an unduly high proportion of dead-in-shell, is related to the nature of the feeding given to the breeding stock several months previously, suitable feeding at this time is of particular importance. The feeding should be such as will bring the birds into a hard, firm condition, without stimulating egg production. A daily feed of a mixture of oats and cracked maize, and the addition of cod-liver oil to the mash at the rate of 1 pint to each 4 stones of mash are valuable aids in bringing the birds into good breeding condition. Further hints on the feeding and management of breeding birds are given in Leaflet No. 83.

BLOOD-TESTING OF BREEDING STOCK.—Poultry-keepers are again reminded of the importance of having the breeding stock blood-tested for the elimination of "carriers" of bacillary white diarrhoea disease. Success in chicken rearing cannot be obtained unless blood-tested, disease-free parent birds are used. "Carriers" of the disease should be sold off immediately they are detected. If not already done, arrangements should be made with the Poultry Instructor to have blood-testing carried out without delay. Those who purchase eggs for hatching are advised to obtain them only from farms where it is definitely known that all the birds have been blood-tested and proved to be free from the disease.

FATTENING OF TURKEYS.—Turkeys intended for the Christmas market should be fed more liberally from this time onwards. Two feeds of soft mash, wet with separated milk or buttermilk if available, should be given daily, while a supply of grain should be fed in the evening just before the birds go to roost.

Turkeys intended for breeding, or for sale for breeding purposes, should be selected now and kept apart from the fattening flock. The feeding of the birds intended for breeding should be such as will maintain them in a hard, fit condition.

GEESE.—Geese which are being fattened should be confined to a small area and fed on a soft mash consisting of potatoes, maize meal and buttermilk or separated milk. The quantity of water supplied should be limited.

WINTER RATIONS FOR LIVE STOCK.

The making up of suitable winter rations for stock feeding purposes requires consideration at this time. Owing to the increased cost of feeding stuffs and to the scarcity of good quality home-grown fodder on most farms, a greater expenditure on purchased feeding stuffs than usual will likely be necessary during the coming winter. It will be essential, therefore, to exercise strict care in the choice of feeding stuffs so as to effect economies and to select only those which offer best value for money. With such a variety of foods on the market the farmer is oftentimes confronted with the problem of making a good choice, apart altogether from considerations of prices. The first essential is to know the foods which are suitable for the particular purpose in view, and the next to classify these into two groups namely, those which are rich in protein and those which are rich in starchy material. By comparing the values of the foods in each group by the method explained below it is a comparatively simple matter to pick out those which offer best value for money.

When the rations are made up on the farm, and this practice is recommended from the point of view of economy in preference to purchasing ready mixed proprietary mixtures, it is generally necessary to buy foods rich in protein so that balanced mixtures may be fed. The food which supplies protein at the cheapest rate can be readily ascertained by dividing the percentage of protein in the food into the price per ton at which it is offered. This gives the cost of the unit of protein in the food. On page 64 of this report, the common feeding stuffs used on the farm are divided into two main groups according to their richness in either protein or starchy material, and the prices of protein and of starch equivalent, as determined from the average prices of these foods, are given. The food, therefore, in which the price of the unit of protein, in the case of the group of protein-rich foods, is lowest,

offers best value for money should be chosen, provided it is suitable for the type of stock to which it is to be fed. Similarly, in the case of starchy feeding stuffs the food in which the price of the unit of starch equivalent is cheapest offers best value for money.

It will be noted from the Table that decorticated earthnut cake supplies protein at the cheapest rate in the group of protein-rich foods. This food is suitable for inclusion in rations for dairy cows, fattening and young growing cattle. Where home butter-making is carried out, however, it may be desirable to use decorticated cotton cake in meal mixtures for milk cows, even although it is slightly more expensive, as it gives a deeper-coloured and firmer butterfat.

At the prices of feeding stuffs given in the Table, the following are examples of economical and suitable meal mixtures for feeding to different classes of stock.

DAIRY COWS.

3 parts by weight crushed oats.
 2 " " " maize meal.
 1 part " " red bran.
 2 parts " " decorticated earthnut cake.
 (or 2½ parts " " decorticated cotton cake).

FATTENING CATTLE.

2 parts by weight crushed oats.
 2 " " " maize meal.
 1 part " " decorticated earthnut cake.

YOUNG GROWING CATTLE.

2 parts by weight crushed oats.
 1 part " " maize meal.
 1 " " " decorticated earthnut cake.

FATTENING PIGS.

3 parts by weight maize meal.
 3 " " " barley meal.
 2 " " " brown pollards.
 1 part " " red bran.

with from 2 to 3 pints of separated milk or buttermilk per head daily. If milk is not available, 1 part of extracted soya bean meal should be added to the mixture given above and 2 lb. of a mineral mixture to each cwt. of meal mixture. High-grade meat meal may be used instead of the soya bean meal.

SOWS WITH LITTERS AND YOUNG PIGS AFTER WEANING.

3 parts by weight maize meal.
 1 part " " flaked maize.
 2 parts " " red bran.
 2½ " " " brown pollards.
 1 part " " extracted soya bean meal.
 ½ " " " high grade meat meal.
 2 lb. of mineral mixture to each cwt. of meal mixture.

If separated milk is available the soya bean meal, meat meal and mineral mixture should be omitted. It is advisable in all cases where separated milk is available to use it in the rations for pigs after weaning in preference to any other protein supplement.

IN-PIG SOWS.

4	parts	by	weight	maize	meal.
4	"	"	"	"	brown pollards.
2	"	"	"	"	red bran.

Where supplies of potatoes are available they can be used with advantage in rations for fattening pigs and in-pig sows. The proportion of cooked potatoes should not exceed 2 parts to 1 part of meal mixture. It is advisable when feeding potatoes to increase the milk allowance for fattening pigs to at least three pints per head daily. If milk is not available the proportion of extracted soya bean meal should be increased to 2 parts.

The addition of mineral mixtures to the above rations is essential except where milk is being fed in pig mixtures. A suitable mineral mixture for dairy cows is equal parts by weight ground limestone or chalk, steamed bone flour and common salt, fed at the rate of 3 lb. per cwt. of meal mixture. For other cattle and for pigs the mineral mixture recommended is 3 parts by weight ground limestone or chalk and 1 part by weight common salt, fed at the rate of 2 lb. per cwt. of meal mixture.

It will be noted that red bran and brown pollards are specified in the rations. Usually red wheat offals are offered at cheaper rates than the white grades, and provided the fibre content of the former is not excessively high there is not much difference in feeding value, and accordingly it is more economical to use the cheaper grades.

The rations given above may be taken as types and are capable of variation to suit different conditions. Should any specific problem arise in connection with the making up of suitable meal mixtures the local Agricultural Instructor will advise, on request.

ANNOUNCEMENTS AND REMINDERS.

GENERAL.

LEAFLETS.—Copies of the leaflets mentioned in this Report can be obtained free from the Ministry on request.

COUNTY POULTRY STATIONS.—The egg distribution season at County Poultry Stations begins on the 1st November. Lists giving the names and addresses of station-holders in each county will be available soon, and may be had from the Secretary of the County Committee of Agriculture, free, on request.

WINTER AGRICULTURAL CLASSES.—The centres selected by County Committees of Agriculture for Winter Agricultural Classes, beginning in early November, are :—

County Antrim—Aghalee, Derriaghy, Cullybackey, Ballyvoy and Ballycastle.

County Armagh—Jerretspass and Mullabawn.

County Down—Rathfriland, Loughbrickland, Hillsborough, and Ballygowan.

County Fermanagh—Florencecourt and Kilturk (Newtownbutler).

County Tyrone—Gortin, Castlederg, Lakemount, Tullymuck, Castlecaulfield and Minterburn.

The instruction given at these classes is of a very practical kind and capable of being applied to everyday work on the farm. Young men residing in the districts mentioned above are strongly advised to avail themselves of the opportunity of obtaining the free instruction which is provided. Full particulars regarding the subjects dealt with are given in Leaflet No. 60. The Secretary of the County Committee of Agriculture or the Agricultural Instructor will give particulars regarding opening dates, etc., on request.

AUTUMN SHEEP DIPPING.—Sheep owners are reminded that it is again compulsory to dip sheep this autumn during the period from the 5th October to the 14th November. All sheep must be double-dipped, allowing an interval of not less than seven or more than fourteen days between the two dippings.

LECTURES.

The following lectures have been arranged by County Committees of Agriculture :—

County.	Day and Date.	Centre.	Time.	Subject.
Down	Monday, 19th Oct.	Hillsboro' Old P.E. School	8 p.m.	Agricultural Topics.
"	Thursday, 22nd Oct.	Dunover P.E. School, Ballywalter	8 p.m.	Management of Pasture.
"	Thursday, 22nd Oct.	do. do.	8 p.m.	Breeding and Rearing of Chickens.

CLASS.—A class in poultry-keeping will be conducted by the Poultry Instructor in the Hall, Park, Co. Londonderry, commencing on Monday, 2nd November, from 5 to 7 p.m. This class will be continued for five weeks.

BROADCAST TALK.—A talk entitled, "A Survey of Crop Improvement", will be given by Mr. E. V. B. Wilson, B.Sc., Ministry of Agriculture, from the Belfast Station of the British Broadcasting Corporation, on Friday, 30th October, at 8-45 p.m.

AWARDS OF UNIVERSITY SCHOLARSHIPS, 1936.

The following are the names of the successful candidates for scholarships which were offered for competition in Northern Ireland this year:—

QUEEN'S UNIVERSITY, BELFAST.

Four scholarships in Agricultural Science each of the value of £380 offered by the Ministry, and two of the value of £400 and £240 respectively, offered by the University under the terms of the "Gibson Bequest" to the sons of farmers in Counties Antrim and Down.

Samuel Campbell, Drumlee House, Finvoy, Ballymoney, County Antrim.

J. W. Jordan, Drummee, Brookeborough, County Fermanagh.

J. S. V. McAllister, 14 North Street, Carrickfergus, County Antrim.

W. R. Scrimgeour, "Rockmount," Newry, County Armagh.

J. W. Patterson, "Loughside," Carryduff, Belfast (Senior Gibson).

John Lowe, Killynure, Carryduff, Belfast (Junior Gibson).

Each of these had completed a course at Greenmount Agricultural College, Muckamore, Co. Antrim.

UNIVERSITY COLLEGE, CORK.

Scholarship in Creamery Management, valued £98 6s., offered by the Ministry.

William McKinley, Grange, Newtownstewart, County Tyrone.

PREMIUMS TO BOARS.

A successful exhibition and sale of boars took place at the annual Autumn Sale (held this year on the 24th September) under the auspices of the Royal Ulster Agricultural Society. This Sale is now recognised as an approved centre for the selection of premium boars, and it is the practice for several of the County Committees to select their applicants for boar premiums in September so that breeders may, if they wish, buy a boar for premium purposes at this Sale instead of waiting for the Spring Sale in the following year.

This year 114 boars (105 large White and 9 large White Ulster) were inspected for premiums, and 41 animals were passed as up to the required standard (39 large White and 2 large White Ulster). These premium boars were disposed of at the Sale at steady prices varying from 8 to 20 guineas.

There were altogether 106 boars sold, and prior to the sale these animals had been all inspected and passed as up to the licensing standard.

RAM SALES, 1936.

The usual Sheep Sales, held under the auspices of the Ulster Ram Breeders' Association, took place this season as follows:—

<i>Venue</i>	<i>Date of Sale.</i>	<i>Description of Exhibit.</i>
Messrs. Robson's Mart, Stewart Street, Belfast.	2nd and 3rd Sept.	Border-Leicester sheep.
Messrs. Allam's Mart, Oxford Street, Belfast.	9th and 10th Sept.	Blackface sheep.
Messrs. Allam's Mart, Oxford Street, Belfast.	24th and 25th Sept.	Border-Leicester sheep.

These Sales are recognised by the Ministry as centres for the selection of premium rams. Selected applicants procuring approved animals at any of the above fixtures are entitled to have their animals conveyed to their destination by rail, free of charge—the cost of carriage at a specially reduced rate being subsequently defrayed by the Ministry.

The healthy condition of the sheep trade was reflected in the high average prices maintained for good sheep throughout each Sale. The demand for premium rams was exceptionally good, and premium lots cleared at higher prices than breeders have received for a number of years.

The following details regarding the Sales may be of interest:—

(a) BORDER LEICESTER.

At the first Sale at Robson's Mart, 59 shearling rams were inspected for premiums, and altogether 30 were passed as up to the premium standard. Selected applicants bid freely for the approved rams, which were rapidly disposed of at an average of approximately 10 guineas each. The highest price obtained for a premium ram at this Sale was 25½ guineas.

At the second Sale held in Allam's Mart, 37 shearling rams were inspected for premiums, and 12 were passed. Selected applicants who had not procured rams at the first Sale were in attendance, and the 12 approved rams were disposed of at prices averaging about $9\frac{1}{2}$ guineas. The highest price paid for a premium ram at this sale was 39 guineas.

(b) BLACKFACE SHEEP.

At the Annual Show and Sale of pedigree blackface shearling rams in Allam's Mart, 165 rams were inspected for premiums, and 104 were passed as up to premium standard. The demand for approved rams was particularly brisk, and the animals were rapidly sold at prices averaging between 10 and 12 guineas. Breeders who are in the habit of sending large consignments to this Sale received better average prices than usual, while several high figures were recorded throughout the Sale for outstanding rams—for example, the Champion Ram of the Show was sold for 27 guineas, while another prize ram realised 26 guineas.

The Ministry is now arranging to procure rams at the Scotch Sales for selected applicants who failed to purchase premium rams at the Belfast Sale.

FOURTEENTH EGG-LAYING TEST 1935-36.

LIST OF AWARDS.

The following is a provisional statement showing the various winners of awards in the above test:—

AWARDS FOR PENS OF BIRDS.

SECTION 1. WHITE WYANDOTTES. (OPEN)

Position.	No. of Pen.	Name and Address of Owner.	Number of Eggs laid by Pen.			
			Super Grade.	First Grade.	Second Grade.	Score value.
1 (£8)	11	Mr. J. Hall, Lilac Cottage, Donacloyne, County Down	1056	133	13	1189
2 (£6)	13	Mrs. J. R. Jackson, Fortview, Coleraine, County Londonderry	879	282	39	1161
3 (£3)	26	Mr. R. Tolerton, Holborn Hall, Plantation, Lisburn, County Down	664	474	102	1138
4 (£2)	3	Mrs. H. G. Darley, Trory, Ballinamallard, County Fermanagh	660	466	92	1126
5 (£1-10)	2	Mrs. D. C. Gamble, Roan Lodge, Coalisland, County Tyrone	516	607	166	1123

SECTION 2. WHITE LEGHORNS (OPEN).

Position.	No. of Pen.	Name and Address of Owner.	Number of Eggs laid by Pen.			
			Super Grade.	First Grade.	Second Grade.	Score value.
1 (£4)	36	Mrs. J. Warnock, Tower View, Rathgael, Bangor, County Down	295	748	148	1043
2 (£2)	37	Mr. J. Waugh, Ballyrickard, Kilwaughter, Larne, County Antrim	537	504	104	1041

SECTION 3. RHODE ISLAND REDS (OPEN).

1 (£8)	63	Mrs. D. Patterson, Ballycastle Road, Coleraine, County Londonderry.	673	593	48	1266
2 (£6)	39	Mrs. R. A. Abernethy, Cherry Hill, Stewartstown, County Tyrone.	791	462	152	1253
3 (£3)	41	Mr. R. A. Copeland, Blackscull, Dromore, County Down.	864	367	45	1231
4 (£2)	46	Mr. T. Foote, Broughmore, Maze, Lisburn, County Antrim.	910	315	37	1225
5 (£1-10)	70	Miss R. L. Sinclair, Ballybirnie, Holyhill, Strabane, County Tyrone.	702	503	113	1205

SECTION 4. ANY OTHER PURE BREED.

1 (£6)	84	Mrs. J. W. Murland, Ardnabannon, Annsboro', County Down.	596	422	142	1018
2 (£3)	83	Mrs. H. W. Merrick, Agivey House, Aghadowey, County Londonderry.	632	341	78	973
3 (£2)	82	Miss C. C. Meara, Coalisland, County Tyrone. (All Light Sussex).	320	630	91	950

SECTION 5(a). WHITE WYANDOTTES (STATION-HOLDERS).

1 (£6)	99	Mrs. M. Rodgers, Ballyginney, Dundrum, County Down.	774	381	102	1155
2 (£3)	95	Mrs. R. McCullough, Bruslee, Ballyclare, County Antrim.	635	415	57	1050
3 (£2)	101	Mrs. E. Warmington, Lake View, Newtownhamilton, County Armagh.	496	526	101	1022

SECTION 5(b). WHITE LEGHORNS (STATION-HOLDERS).

Position.	No. of Pen.	Name and Address of Owner.	Number of Eggs laid by Pen.			
			Super Grade.	First Grade.	Second Grade.	Score value.
1 (£4)	113	Mrs. J. Brown, Gorsebank, Culcrum, County Antrim.	697	387	96	1084
2 (£2)	108	Mrs. J. Knox, Shanmullagh, Ederney, County Fermanagh.	762	311	101	1073

SECTION 5(c). RHODE ISLAND REDS (STATION-HOLDERS).

1 (£7)	125	Mrs. M. McClintock, Laymore, Ballymena, County Antrim.	524	644	122	1168
2 (£4)	126	Mrs. R. McGiffert, Rathcunningham, Toye, County Down.	804	351	96	1155
3 (£2)	121	Miss J. Kane, Dartries, Castlerock, County Londonderry.	387	726	110	1113
4 (£1-10)	116	Mr. K. Dunlop, Scarva, County Down.	635	421	134	1056

SECTION 6. POULTRY CLUBS AND YOUNG FARMERS' CLUBS.

1 (£6)	149	Banbridge and District Poultry Club County Down. (Rhode Island Reds).	674	578	70	1252
2 (£3)	141	Ballyclare Poultry Club, County Antrim. (White Leghorns).	636	540	68	1176
3 (£2)	136	Ballywalter Young Farmers' Club, County Down. (White Wyandottes).	529	539	89	1068

CHAMPIONSHIP CUP.

The Silver Cup offered by the Ministry in respect of the pen laying the greatest number of Super-grade and First-grade eggs during the period of the Test was won by :—Mrs. D. Patterson, Ballycastle Road, Coleraine, Co. Londonderry. (Pen No. 63 Rhode Island Reds 1266 Super-grade and First-grade eggs).

MEDALS FOR SINGLE BIRDS.

Award	Qualification.	Pullet No.	Pen No.	Breed	Owner	Eggs laid.			Score Value
						Super Grade	1st Grade	2nd Grade	
Silver Medal	Best pullet in entire Test	72	12	White Wyandotte	Mrs. J. R. Jackson, Fortview, Coleraine, Co. Londonderry	103	165	14	268
Bronze Medal	Best pullet in Section 2	218	37	White Leghorn	Mr. J. Waugh, Ballyrickard, Kilwaughter, Co. Antrim				
Bronze Medal	Best pullet in Section 3	261	44	Rhode Island Red	Mrs. M. Finlay, Langfield, Armoy, Co. Antrim	73	149	48	222
Bronze Medal	Best pullet in Section 4	494	83	Light Sussex	Mrs. H. W. Merrick, Agivey House, Aghadowey, Co. Londonderry	236	16	—	252
Bronze Medal	Best pullet in Section 5(a)	568	95	White Wyandotte	Mrs. R. McCullough, Bruslee, Ballyclare, Co. Antrim	239	8	—	247
Bronze Medal	Best pullet in Section 5(b)	643	108	White Leghorn	Mrs. J. Knox, Shanmullagh, Ederney, Co. Fermanagh	77	182	21	259
Bronze Medal	Best pullet in Section 5(c)	701	117	Rhode Island Red	Mrs. R. J. Dunn, Ballyskeagh, Artigarvan, Co. Tyrone	195	52	3	247
Bronze Medal	Best Pullet in Section 6	909	152	Rhode Island Red	Garvagh Poultry Club	29	237	14	266
						236	29	—	265

OTHER AWARDS.

AWARDS FOR TYPE.—The three special awards of £2 each for pens of the best type of (1) White Wyandottes; (2) White Leghorns; and (3) Rhode Island Reds, amongst those which qualified for First-class certificates, were won by the following:—

White Wyandottes—Mrs. D. C. Gamble, Roan Lodge, Coalisland, Co. Tyrone. (Pen 2).
 White Leghorns—Mrs. F. R. Browne, Lakeview, Enniskillen, Co. Fermanagh. (Pen 31).
 Rhode Island Reds—Mrs. J. McNeill, Drains Bay, Larne, Co. Antrim. (Pen 59).

£1 AWARD IN RESPECT OF THE PEN OF LIGHT-SUSSEX of best type amongst the pens of that breed qualifying for First-class or Second-class certificates was won by:—

Mrs. H. W. Merrick, Agivey House, Aghadowey, Co. Londonderry. (Pen 83).

WINTER PRODUCTION AWARD.—The award of £2 offered in respect of the pen laying the greatest number of Super-grade and First-grade eggs during the first four periods (16 weeks) of the Test was won by:—

Mrs. R. McCullough, Bruslee, Ballyclare, Co. Antrim. (Pen No. 95 White Wyandottes, 444 Super-grade and First-grade eggs.)

SCIENTIFIC POULTRY BREEDERS ASSOCIATION'S CUP.—The Challenge Cup offered by the Council of this Association in respect of the pen laying the greatest number of Super-grade and First-grade eggs during the winter period, that is, from the commencement of the Test to the end of the sixteenth week, was also won by:—

Mrs. R. McCullough, Bruslee, Ballyclare, Co. Antrim. (Pen 95).

SILVER MEDALS PROVIDED BY THE NORTHERN IRELAND UTILITY POULTRY SOCIETY.—The four Silver Medals provided by this Society for the best pens of (1) White Wyandottes, (2) White Leghorns, (3) Rhode Island Reds, and (4) any other pure breed of pullets, owned by members of the Society competing in the Test have been won by:—

- (1) Mrs. H. G. Darley, Trory, Ballinamallard, Co. Fermanagh.
Pen No. 3. White Wyandottes.
- (2) Mrs. F. R. Browne, Lakeview, Enniskillen, Co. Fermanagh.
Pen No. 31. White Leghorns.
- (3) Mr. Thos. Foote, Broughmore, Maze, Lisburn, Co. Antrim.
Pen No. 46. Rhode Island Reds.
- (4) Mrs. H. W. Merrick, Agivey House, Aghadowey, Co. Derry.
Pen No. 83. Light Sussex.

A detailed report on the Test is being prepared and copies will be available for distribution at an early date.

FIFTEENTH EGG LAYING TEST.

The fifteenth of the series of egg-laying tests conducted by the Ministry at Stormont, commenced on the 2nd October, 1936. The number of entries received was in excess of the suitable accommodation available, and a ballot had to be taken. The following are particulars of the Sections and the number of pens in each Section :—

Section 1	White Wyandottes (open)	28 pens	
„ 2	White Leghorns (open)	13 „	
„ 3	Rhode Island Reds (open)	31 „	
„ 4	Any other pure breed (open)	16 „	{ 13 pens Light Sussex 2 „ Buff Rocks 1 „ Welsummers
„ 5(a)	White Wyandottes (Stationholders)	15 pens	
„ 5(b)	White Leghorns (Stationholders)	10 „	
„ 5(c)	Rhode Island Reds (Stationholders)	21 „	
„ 6	Poultry Clubs and Young Farmers' Clubs—any pure breed	12 „	{ 8 pens Rhode I. Reds. 3 „ White Wyandottes 1 „ White Leghorns

The numbers of birds of each breed represented in the Test are :—

Rhode Island Reds	..	360
White Wyandottes	..	276
White Leghorns	..	144
Light Sussex	..	78
Buff Rocks	..	12
Welsummers	..	6
Total ..		876 birds

THE RANGES OF RETAIL PRICES OF PHOSPHATIC MANURES
IN NORTHERN IRELAND.

		Price per ton			
Basic Slag (40/42%)	...	£3 15	0	to	£4 5 0
Basic Slag (36/38%)	...	£3 0	0	to	£3 17 6
Gafsa Rock Phosphate	...	£2 15	0	to	£2 17 6
Semsol	...	£2 19	0	to	£3 15 0
Superphosphate (35/37%)	...	£3 10	0	to	£3 15 0

IMPORTS AND EXPORTS.

Table showing the Imports and Exports through Northern Ireland ports of certain Agricultural Products during the month ended 31st August, 1936, and the eight months ended 31st August, 1936, with comparative figures for the corresponding periods in 1935.

(These figures are supplied through the courtesy of the Ministry of Commerce and are subject to revision).

COMMODITY	IMPORTS.				EXPORTS.			
	Month ended 31st August		Eight months ended 31st August		Month ended 31st August		Eight months ended 31st August	
	1936	1935	1936	1935	1936	1935	1936	1935
Bacon cwt.	1,477	1,815	12,478	21,941	28,612	17,709	253,723	138,647
Hams cwt.	912	1,333	6,524	6,543	11,518	9,877	93,715	83,721
Pork cwt.	—	2	49	8	1,168	1,466	26,045	27,493
Butter cwt.	7,435	5,369	98,757	97,963	1,369	900	4,565	4,153
Eggs gt. hds.	3,791	7,644	52,234	48,652	287,766	265,002	2,731,063	2,533,443
Oat Products (inc. Oatmeal) cwt.	3,429	1,784	19,416	14,149	2,032	2,106	49,888	55,994
Potatoes tons	—	—	279	148	3,220	4,747	184,956	100,196
Coutry cwt.	1	5	130	156	6,452	6,257	116,108	106,998
Grass Seeds cwt.	766	882	8,766	34,715	3,993	3,168	273,482	222,415

During the month of August, 1936, there were 2,857 cwts. of oats imported direct through Northern Ireland ports from abroad. This figure is the same as that for the corresponding month last year.

PRICES OF FEEDING STUFFS.

The following table shows the average retail prices per cwt. of Feeding Stuffs at 1st October, 1936, with comparative figures for the corresponding date in 1935.

	1936.				1935.			
	Price per cwt.	Protein equivalent	Price per unit of starch equivalent	Starch equivalent	Price per unit of starch equivalent	Protein equivalent	Price per unit of starch equivalent	Starch equivalent
STARCHY FOODS:								
Maize (whole)	s. 6 6	6.8	s. 1 7	81.5	s. 14 5½	6.8	s. 81.5	d. 2½
Maize Meal ..	6 11½	6.8	1 8	81.5	15 8½	6.8	81.5	1 3½
Bran, Red ..	7 6	10.0	3 4	45.3	14 0	10.0	45.3	3 1
Bran, White ..	8 7½	10.0	3 10	45.3	16 0	10.0	45.3	3 7
Pollard, Brown ..	7 8	11.0	2 2	71.2	13 4	11.0	71.2	2 1
Pollard, White ..	8 8	11.0	2 5	71.2	14 6½	11.0	71.2	2 3
Barley Meal ..	8 2½	6.2	2 4	69.7	23 1	6.2	69.7	2 1
Oats ..	6 3	7.6	2 1	60.0	18 5	7.6	60.0	2 4
Wheat (Whole) ..	8 10	9.6	2 5½	72.0	13 6½	9.6	72.0	1 9½
PROTEIN FOODS:								
Linseed Cake, home-made	11 1	25.0	3 1	71.8	8 4	25.0	71.8	2 11
Linseed Cake, foreign ..	10 1	25.0	2 10	71.8	7 4	25.0	71.8	2 7
Linseed Cake Meal ..	10 6	25.0	2 11	72.8	7 8	25.0	72.8	2 7½
Cotton Cake, decorticated	9 6½	35.0	2 8	71.2	4 11½	35.0	71.2	2 5½
Cotton Cake, undecorticated	6 10	17.0	3 6	39.2	6 11½	17.0	39.2	3 0
Earth Nut Cake, decorticated	9 0½	41.0	2 6	73.0	4 1	41.0	73.0	2 4
Soya Bean Meal (extracted)	10 7½	38.0	3 4	64.0	4 7	38.0	64.0	2 8½
Bean Meal ..	8 0	20.0	2 5	66.0	8 0	20.0	66.0	2 5
Fish Meal (60% protein)	15 6	53.0	5 10	58.9	6 3	53.0	58.9	5 7
Meat and Bone Meal (40% protein)	9 10	36.2	5 5	44.0	5 5½	36.2	44.0	4 6
Meat and Bone Meal (60% protein)	14 2½	54.9	4 8	61.3	5 0	54.9	61.3	4 6
OTHER FEEDING STUFFS:								
Linseed, whole	15 10½	19.0	2 8	119.2	16 5	19.0	119.2	2 7½
Palm Nut Cake ..	8 0	17.0	2 3	70.2	9 4	17.0	70.2	2 3
Palm Nut Meal ..	8 0	17.0	2 1	78.0	9 4	17.0	78.0	2 0
Potatoes ..	3 3	0.6	3 7	18.0	86 1	0.6	18.0	2 10
Oat Straw ..	2 3	0.9	2 3	20.0	40 9	0.9	20.0	1 10
Meadow Hay ..	2 5	4.6	1 4	37.0	7 7	4.6	37.0	0 11

PRICES OF FEEDING STUFFS.

One of the objects of the foregoing table is to guide farmers in the economic purchase of feeding stuffs.

Ignoring their mineral content, the valuable constituents of any feeding stuff, whether home-grown or purchased, consist of:—

- (1) Carbohydrates—a group of substances which include materials such as starch, sugar, etc. They supply heat or energy to the animal, and the surplus is stored by the animal as fat.
- (2) Oil—which also provide heat or energy, the surplus being stored as fat. For this purpose oil is approximately $2\frac{1}{2}$ times as valuable as the carbohydrates, but its presence in the ration in excessive quantities may lower the digestibility of the ration and cause digestive troubles.
- (3) Protein—The group of bodies termed protein or albuminoids contain nitrogen. Protein is the only ingredient of a feeding stuff which can produce flesh or muscle, and hence its special importance.

All animals require a certain amount of each of the above constituents, but the relative amounts depend upon the class of stock. Thus, for example, a two-year-old fattening bullock requires a relatively small amount of protein (flesh forming material). Its ration should consist mainly of foods rich in carbohydrates, i.e., fat producing substances. On the other hand, a dairy cow is producing milk, which is a substance rich in protein, and as the protein, that is flesh forming material in milk, can only be derived from the protein in the food, the ration for the dairy cow must contain considerably more protein than that for the fattening bullock.

There are very wide differences in the composition of feeding stuffs, both home grown and purchased. Some, such as oats and maize, are rich in carbohydrates, and, therefore, particularly valuable for fattening purposes, whilst others, such as decorticated cotton cake, earthnut cake and linseed cake, are rich in protein, and are chiefly valuable for their flesh and milk-producing properties.

In the following table the composition of some of the more commonly used feeding stuffs is shown:—

PERCENTAGE COMPOSITION.

	Water.	Protein.	Oil.	Carbohydrates.
Turnips (Swedes)	88	1	0.2	9
Potatoes	75	2	0.1	21
Oat Straw	14	4	2	37
Meadow Hay	10	10	3	45
Pasture Grass	80	3.5	0.8	10
Cabbage	89	1.5	0.5	8
Fattening Foods :				
Oats	13	9	6	60
Maize Meal	12	10	4	70
Barley Meal	13	12	2	66
Flesh Forming Foods :				
Linseed Cake	11	30	10	35
Decorticated Cotton Cake	9	40	9	26

The farmer frequently asks what is the cheapest feeding stuff to buy. It is, however, often very difficult to give a direct answer. Much depends upon what the feeding stuff is required for, whether for fattening or milk production. Again, maize and oats are essentially fattening foods, whilst decorticated cotton cake is a flesh-forming food, and it would be just as futile to use the cost per ton to compare their values as it would be to use the cost per ton to compare the values of, say, sulphate of ammonia and superphosphate.

Foods of similar composition can, however, be compared, and it is possible for the enterprising farmer to effect considerable economies, not only in the use of home-grown feeding stuffs, but particularly in the purchase of concentrated feeding stuffs, by studying the market prices.

The starch equivalent figure is a measure of the energy, heat or fat producing value of the feeding stuff, and shows the number of pounds of starch which would be required to give the same heat or energy as 100 lb. of the feeding stuff. For example, the table on page 64 states that the starch equivalent of maize meal is $81\frac{1}{2}$, or, in other words, 100 lb. of maize meal will provide as much heat or energy as $81\frac{1}{2}$ lb. of pure starch.

The protein equivalent figure shows the number of pounds of digestible flesh or muscle producing material in 100 lb. of each of the feeding stuffs listed.

PRICES OF FAT STOCK.

The following were the average prices per live cwt. of bullocks and heifers, sold at Belfast Auction Marts during each of the five weeks ended 29th September, 1936:—

Week ended.	Bullocks.			Heifers.		
		s.	d.		s.	d.
1st September . . .	...	33	9	...	33	6
8th September, . . .	...	33	6	...	33	0
15th September . . .	...	32	0	...	33	0
22nd September . . .	...	32	0	...	32	0
29th September . . .	...	32	3	...	32	3

PRICES OF LIVE STOCK.

Average Prices of Live Stock at Fairs during the month of September, 1936.

Date	Fair	Calves (under 9 months)	Store Cattle	Fat Cattle (18 months and over)	Springers		Milch Cows	Store Sheep		Fat Lambs (under 12 months old)	Young Pigs
					Cows	Heifers		Feeding Lambs (under 12 months old)	Breeding Ewes		
		Per head £ s.	Per cwt. Live weight. 33/- to 36/- 30/- to 33/-	Per cwt. Live wt. 32/- 30/-	Per head £ s.	Per head £ s.	Per head £ s.	Per head £ s.	Per head £ s.	Per head £ s.	Per head £ s.
1	Omagh	5 15	31/- to 34/9	31/6	14 0	13 0	12 15	—	—	—	1 5
2	Rathfriland	5 5	32/6 to 34/-	31/-	13 0	—	12 0	—	—	—	—
3	Ballymoney	5 8/6	28/- to 34/6	33/-	17 10	11 0	—	—	—	—	—
3	Strabane	4 10	27/6 to 35/-	30/6	15 12/6	12 18/9	16 0	—	—	—	—
4	Londonderry	—	29/- to 34/6	32/-	15 0	12 5	—	—	—	—	—
4	Moy	—	30/- to 34/-	31/-	15 0	13 0	12 10	—	—	—	—
8	Dungiven	—	30/- to 34/-	31/-	17 10	—	15 10	—	—	—	—
8	Irvinestown	5 12/6	25/- to 29/-	31/-	12 10	11 10	12 0	—	—	—	—
9	Crossgar	— 5	27/- to 35/-	—	14 10	—	13 0	—	—	—	—
10	Enniskillen	4 5	26/- to 30/6	31/-	15 0	14 10	14 0	—	—	—	—
11	Ballygawley	— 3/3	30/- to 32/-	—	17 10	15 10	15 15	—	—	—	—
16	Lisnaskea	4	30/- to 34/-	31/-	18 0	16 0	17 0	—	—	—	—
17	Ballynahinch	—	23/- to 29/6	29/-	14 0	12 10	12 0	—	—	—	—
19	Portadown	4 5	29/- to 33/-	28/6	13 10	13 0	12 15	—	—	—	—
21	Camlough	4 10	30/- to 35/-	30/-	15 0	13 0	13 10	—	—	—	—
21	Money more	4 5/9	29/- to 35/-	29/-	20 0	18 0	—	—	—	—	—
22	Fintona	5 12/6	28/- to 35/-	29/6	13 0	—	—	—	—	—	—
24	Antrim	5 12/9	28/- to 35/-	29/6	15 10	—	—	—	—	—	—
25	Castlederg	3 10	23/6 to 35/-	—	20 0	20 10	19 0	—	—	—	—
25	Killylea	—	23/6 to 35/-	—	15 10	—	—	—	—	—	—
26	Ballymena	6 4/6	—	—	20 0	20 10	19 0	—	—	—	—

* Downs and Cross.

† Long Wools.

† Mountain.

SHIPMENTS OF LIVE STOCK.

Statement showing the Shipments of Live Stock from Northern Ireland ports during the following periods :—
Months of Sept., 1936, Aug., 1936, Sept., 1935; Nine Months ended, 30th Sept., 1936, and 30th Sept., 1935.

PORTS OF :—		CATTLE.						SHEEP.				PIGS.		Horses	
		Fat.	Stores.	Milch Cows.	Springers.	Calves.	Total.	Fat.	Stores.	Lambs.	Total.	Fat.	Stores.		Total.
Belfast	..	5,013	5,412	2,065	89	48	12,627	9,040	—	—	9,040	2,105	1	2,106	259
Larne	..	77	1,481	—	—	—	1,558	6,740	230	—	6,970	922	274	1,196	24
Londonderry	..	90	7,602	73	71	201	8,037	5,694	—	—	5,694	223	—	223	9
Newry	..	40	273	—	4	—	317	999	—	—	999	—	5	5	—
Total, September, 1936		5,220	14,768	2,138	164	249	22,539	22,473	230	—	22,703	3,250	280	3,530	292
Total, August, 1936 ..		4,972	11,184	2,019	345	173	18,693	183	200	37,246	37,629	2,929	—	2,929	301
Total, September, 1935		6,698	18,474	2,479	338	101	28,090	22,819	6	—	22,825	8,441	42	8,483	351
Total, Nine Months ended 30th Sept., 1936		58,278	130,230	12,526	1,819	12,535	215,388	29,065	435	109,587	139,087	34,209	684	34,893	4,240
Total, Nine Months ended 30th Sept., 1935		54,624	148,492	13,308	2,660	15,523	234,607	36,155	6	92,259	128,420	65,091	2,402	67,493	4,445

Table showing the numbers of Live Stock (1) exposed for sale, and (2) sold at 20 fairs in Northern Ireland during the months of September, 1935, and August and September, 1936 :—

Description of Live Stock.	September, 1935.		August, 1936.		September, 1936.	
	Number exposed for sale.	Number sold.	Number exposed for sale.	Number sold.	Number exposed for sale.	Number sold.
Store Cattle ...	9,007	5,261	7,008	5,082	6,257	4,414
Fat Cattle ...	1,247	1,069	1,337	1,235	1,314	1,148
Dairy Cattle ...	1,726	1,363	1,528	1,142	1,456	1,147
Sheep ...	2,642	2,000	652	482	2,465	1,872
Lambs ...	3,873	2,912	2,588	2,179	2,786	2,248
Young Pigs ...	3,151	2,748	2,974	2,273	2,731	2,291

Store cattle were in smaller number than a month ago and trade generally continued slow. Large stores in forward condition remained in favour throughout the month, while trade for smaller animals was confined to local graziers. There was little change in prices at the beginning of the month, but towards the end a firmer tendency was noticeable. Fat cattle were also in somewhat smaller supply during September, with prices easing further. The offerings of dairy cattle were almost similar to last month, and trade generally was good. Good quality stock were in keen demand and sold readily at advanced prices, young springers again being the chief attraction. On the whole, trade in sheep was good, and larger supplies were bought up at satisfactory rates. A keen trade ruled for fat lambs at increased prices, whilst breeding ewes also were meeting a good demand, and selling at firmer rates.

Young pigs were in slightly smaller numbers at fairs and trade generally remained quiet in the beginning of September, but improved towards the end of the month. Brood sows were small offerings and only the best were sold at around late rates.

This report will be sent free monthly as issued on application being made to the Secretary, Ministry of Agriculture, Stormont, Belfast.

13th October, 1936.

ULSTER DAIRY SCHOOL, COOKSTOWN.

U. D. S.

USEFUL and practical courses of instruction in poultry-keeping, dairying and domestic science are provided for girls at this School.

DEFINITE advantages are derived from a course of training, whether the object is to return home or to take employment elsewhere.

SCHOOL fees are only £3 : 3 : 0 per term of 11 weeks, inclusive of board and residence.

Candidates for admission should obtain copies of the prospectus from the Ministry of Agriculture, Stormont, Belfast, and send in application forms without delay. Next term begins on 13th October, 1936.

MINISTRY OF AGRICULTURE. **List of Leaflets and other Publications.**

LEAFLETS.

- | | |
|---|---|
| <p>No 1. Flax Seed, 1936.
 " 2. Improvement of Farm Poultry.
 " 3. Feeding for Egg Production.
 " 4. Marketing of Eggs.
 " 5. The Dishorning of Calves.
 " 6. The Packing of Apples in Standard Boxes.
 " 7. Potato Trials
 " 8. Seed Testing for Farmers.
 " 9. The Renovation of Orchards.
 " 10. Fruit Tree Pests—Capsid Bugs.
 " 11. Fruit Tree Pests—Aphides and Apple Sucker.
 " 12. Fruit Tree Pests—Caterpillars
 " 13. Contagious Abortion in Cattle.
 " 14. Cheese-making on the Farm.
 " 15. Suitable Varieties of Fruit.
 " 16. The Feeding of Dairy Cows.
 " 17. Home Bottling of Fruits and Vegetables.
 " 18. Marketing of Dead Poultry.
 " 19. How to Feed Linseed.
 " 20. The Hatching and Rearing of Chickens.
 " 21. The Uses and Advantages of Portable Poultry Houses.
 " 22. Leather-Jacket Grubs.
 " 23. The Handling and Care of Wool.
 " 24. Fluke in Sheep.
 " 25. The Rearing and Management of Young Horses.
 " 26. Ordnance Survey Maps for Farmers.
 " 27. How to Keep Eggs Clean
 " 28. The Construction of a Laying House for Poultry.
 " 29. The Selection and Breeding of Laying Hens.
 " 31. Coccidiosis in Poultry.
 " 32. Roup of Poultry (Fowl Pox).
 " 33. Spraying Calendar for Apple Orchards.
 " 34. The Pruning of Apple Trees.
 " 35. The Fattening of Pigs.
 " 36. Advantages of Milk Recording.
 " 37. The Raising and Fattening of Turkeys.
 " 38. The Destruction of Charlock.
 " 39. The Production of Clean Milk.
 " 40. The Laying Down and Management of Temporary Pastures.
 " 41. Blackleg, Blackquarter or Quarterill.
 " 42. The Purchase of Balanced Rations for Dairy Cows.
 " 43. Tuberculosis in Poultry.</p> | <p>No. 44. Results of Crop Experiments, 1935.
 " 45. The Breeding and Rearing of Pigs.
 " 46. Hints for Winter Egg Production.
 " 47. The Care and Management of Sheep.
 " 49. American Gooseberry Mildew.
 " 50. Potato Blight.
 " 51. Butter-making on the Farm.
 " 52. Gapes in Chickens.
 " 54. The Breeding and Rearing of Calves.
 " 55. Destruction of Ragwort or Benweed.
 " 56. Identification of Egg Supplies.
 " 57. How to have Eggs of First Quality.
 " 58. How the Fertilisers and Feeding Stuffs Act benefits the Farmer.
 " 59. Bacillary White Diarrhoea (Pullorum Disease).
 " 60. Advantages of Winter Agricultural Classes.
 " 61. The Care and Management of Breeding Bulls.
 " 62. The Production of Timber on the Farm.
 " 63. Sheep—Castration, Docking, Foot-Rot and Care of Feet.
 " 64. The Destruction of Warble Fly Maggots in Cattle.
 " 65. The Packing of Apples in Barrels.
 " 66. Seed Testing Facilities for Traders.
 " 67. The Cultivation of Vegetables.
 " 68. The Cultivation of Strawberries.
 " 69. The Construction of Piggeries.
 " 70. Ringworm.
 " 71. The Cultivation of Raspberries.
 " 72. Tree Planting for Shelter and Ornament.
 " 73. The Propagation and Maintenance of Healthy Stocks of Potatoes.
 " 74. New Pure Strains of Flax.
 " 75. Pig Production and the Pigs Marketing Scheme.
 " 76. Acarine (Isle of Wight) Disease of Bees.
 " 77. Licensing of Milk Producers and Distributors.
 " 78. Graded Milk.
 " 79. The Picking and Storing of Apples.
 " 80. Hoose or Husk in Farm Stock.
 " 81. The Construction of Cow Houses.
 " 82. White Scour in Calves.
 " 83. The Care, Management and Feeding of the Poultry Breeding Stock.</p> |
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Any of the above leaflets may be obtained free of charge and post free on application to the Secretary, Ministry of Agriculture, Stormont, Belfast.

CIRCULARS.

- No. 1. Phosphatic Fertilisers.
 " 5. Why Pay a Tax on the Horns of Cattle ?
 " 8. Basic Slag.
 " 9. Smut in Oats.
 " 10. Purchase of Fertilisers and Feeding Stuffs.
 " 11. Fertilisers and Feeding Stuffs Act—General Summary.
 " 12. The Treatment of Liver Fluke.
 " 13. The ox-Warble Fly.
 " 306. Fertilisers and Feeding Stuffs Act, 1926—Revision of Regulations.

MISCELLANEOUS PUBLICATIONS.

Store Cattle.
 Reports on Egg-Laying Tests.
 Crop Insurance.
 List of Growers of Certified Crops of Immune Varieties of Potatoes.
 List of Growers of Certified Crops of Non-Immune Varieties of Potatoes.
 The Ministry's Monthly Report.
 Register of Premium Stallions.
 Guide to the Live Stock Breeding Act (Northern Ireland), 1922.
 Guide to the Marketing of Fruit Act (Northern Ireland), 1932.

Any of the above publications may be obtained free of charge and post free on application to the Secretary, Ministry of Agriculture, Stormont, Belfast.

The following publications can be obtained from His Majesty's Stationery Office, 80 Chichester Street, Belfast, at the prices stated :—

- (1) The Annual Report of the Ministry of Agriculture for Northern Ireland. Price 2/6 net.
- (2) Annual Report upon the Agricultural Statistics of Northern Ireland. Price 2/- net.
- (3) The Journal of the Ministry of Agriculture for Northern Ireland. Price 2/6 net.
- (4) The Agricultural Output of Northern Ireland, 1925. Price 2/6 net.